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Drug and Cosmetic Industry

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SPEAKING FROM FRANCE

A. E. DESPERROIS *has an M.A. degree in Sciences and is a Chemical Engineer E.N.S.C.P. (Escole Nationale Superieure de Chimie de PARIS). He has managed the technical services of Jean d'ALBRET-ORLANE Company of Paris, producers of perfumes and beauty products, since it was founded. Previously he was a Consulting Engineer in perfumes and toilet goods.*

Glycerine
IN MAKE-UP PRODUCTS

Since SCHEELE, 180 years ago, made his famous communication to the Pharmaceutical Society of Upsala regarding his discovery in the residue from pharmaceutical plaster manufacturing of a sugary liquid, the many uses of glycerine (as it was named by Chevreul) have multiplied and even the later discovery of glycols and of other polyols has not slowed down its progress.

Some of those uses have had tremendous repercussions, if only in dynamite, but we shall only deal here with the more peaceful uses. Glycerine is used in the cosmetic industry in a great number of preparations, because its desirable properties cannot all be replaced by any other product comparable with glycerine.

1—Its hygroscopic power is superior to that of all the other polyalcohols. A 57.6% solution of glycerine has a composition which is invariable in normal atmospheric conditions. The presence of glycerine, even in small proportion (between 2 and 5%) gives the water content of a cream a permanent quality which is extremely valuable. These days when hydrating, or moisturizing products are so much in demand, the presence of glycerine remarkably increases the hydrating power of a preparation.

2—Glycerine has a dissolving and plasticizing power superior to that of water. This property is particularly interesting, since a great number of products are used nowadays in the foundation of modern creams and it is necessary to present the public with perfectly homogeneous products. The presence of glycerine in a make-up cream enables the pigments to spread out far more uniformly, thus giving a cream which can be used more easily on the skin.

3—It is particularly rare to discover a skin, even among the most sensitive and delicate, which will not tolerate glycerine solutions. It is on the contrary a very softening product. Furthermore, it has advantage over certain glycols in that it is not toxic.

4—Glycerine does not change with the contact of air in normal temperature conditions. Thus it is not to be

feared that unusual colors will appear nor that odors will eventually develop due to glycerine when products are kept for a long time. This stability is extremely important particularly in liquid make-ups where color variations can take place during the life of the products.

5–Glycerine is chemically compatible. If coloring materials and pigments have pH which is very different from the neutral 7, they still may be acceptable in a glycerine formulation.

6–Glycerine also possesses a fixing power for the perfumes; one knows how difficult it can be to maintain permanently the same perfume note to accompany a make-up product because of evaporation or internal reactions. The presence of glycerine in a make-up insures conservation of the perfume note chosen until the product has been used up.

In all the make-up products, whether they be creams, bases, cream rouge, lipstick, the product which is spread on the skin must not penetrate too deeply. Whereas, in a treatment cream one looks for a very powerful penetration quality for the base, which will support the active product. On the contrary, make-up products should not penetrate the skin. The problem is thus entirely different regarding the use of glycerine in make-up. At the level at which glycerine is used in make-up products its penetration is sufficiently low to avoid undesirable effects.

For still more complete reduction of penetration where it is not desired, it is frequently the practice to use starch glycerol which possesses all the softening and hygroscopic qualities of glycerine. Starch glycerol or glycerite of starch as it is also known, is composed of the following ingredients:

Starch	10 grams
Distilled water	20 cc
Glycerine	70 cc
Preservative	

When a smooth paste of starch, water and glycerine is made, the mixture is heated to around 140°C under constant stirring until the jelly becomes translucent.

LIP JELLIES

Poucher has suggested a number of formulas for lip jellies based on a glycerol-gelatin composition (1). As a basic recipe the following is used:

Glycerine	750
Gelatin	20
40% Formaldehyde	10
Distilled water	220
Total	1000

This formula may be modified by adding either a solution of eosine or of an ammoniacal solution of carmine. Although rose is a popular fragrance, others may be used.

Cerebelaud, the celebrated French perfumer and cosmetic chemist approached the same product slightly differently (2).

Edible gelatin	20 grams
50% Glycerine in rose water	1000 grams

Although varying in approach, the end product contains 2% gelatine in a 50% (approx.) glycerine solution in an already perfumed vehicle, rose water. This jelly may be tinted to suit.

A liquid lipstick formulated along modern lines is attributed to deNavarre.

Polyvinyl alcohol	4 parts
Glycerine	2 parts
Soluble color	1 part
Alcohol	10 parts
Water	83 parts
Total	100 parts

Here the glycerine acts as a plasticizer for the polyvinyl alcohol and prevents drying of the lips.

A liquid rouge in former times was a simple solution of carmine in enough glycerine and water to give the product penetration, lubrication during the application and a moist "dewey" appearance that was considered natural.

However liquid rouges of today are exemplified by the formula given by Heinrich (3).

Color	6.0%
Glycerine	4.0%
Methyl Paraben	0.1%
Diethylene glycol stearate	9.0%
Spermaceti	3.0%
Sodium lauryl sulfate	1.0%
Water	76.9%
Perfume	q.s.

This is a creamy liquid emulsion which may contain both soluble coloring as well as color lakes.

A solid cream rouge currently popular is based on vanishing cream utilizing the plasticizing properties of glycerine. It consists of the following materials (3):

Stearic acid	20.0 parts
Cetyl alcohol	2.0 parts
Glycerine	10.0 parts
Potassium hydroxide	1.0 parts
Water	58.9 parts
Pigment	8.0 parts
Methyl Paraben	0.1 parts
Perfume	q.s.

A more recent version of emulsified lipstick is the following formula devised by Velon (4).

Triethanolamine	6.5 parts
Glycerine	21.5 parts
Eosine solution	3.0 parts
Stearic acid	15.0 parts
Mineral oil	22.0 parts
Ozokerite	26.0 parts
Oleic acid	8.5 parts

This type of lipstick was exceedingly popular some thirty or so years ago in a somewhat different formulation. The above formula may be modified by color lakes to make more acceptable lipstick shades in these modern times. Moisturizing is "built" into the lipstick while emulsification is obtained with currently available materials.

Liquid powders of former times often contained from 10–15% glycerine along with the usual pigments such as talc, zinc oxide, precipitated chalk and suitable colorants of the earth pigment class.

A transitional product between the older liquid powders and the modern liquid make-up is exemplified by two formulas, both patented some time ago. In the older formula, use is made of undecylic (5) acid to give a better wetting to the pigments and longer lasting properties on the skin.

Zinc stearate	3.8 parts
Undecylic acid	0.2 parts
Titanium dioxide	8.0 parts
Talc	10.5 parts
Glycerine	6.0 parts
Water	80.0 parts

The latter formula patented during the last war does not utilize glycerine directly but it does use glycerol tristearate to reduce the surface tension of the oil vehicle (6).

Sesame oil	64.0 parts
Zinc oxide	11.0 parts
Titanium dioxide	16.0 parts
Oxycholesterol	2.0 parts
Glycerol Tristearate	1.0 part
Color	5.5 parts
Perfume	0.5 parts
p-Hydroxbenzoic acid	q.s.

For the past few years, semi-liquid make-up bases containing bentonite have been successfully used. They have a great advantage: They dry fairly quickly on the skin thus giving it a powdery aspect which is very attractive, but they still have one problem: as they dry they have a tendency to tighten the skin thus creating a sort of mask. This is where the use of glycerine is particularly appreciated. The drying process is slowed down according to the quantity of glycerine used. The astringent action is overcome by the softness and hygroscopic quality of glycerine, and as a result one can create a make-up base which will correspond exactly to what one has in mind.

Here are a few formulas for make-up products in which glycerine appears:

1—Triethanolamine stearate	25
Water	35
Glycerine	20
Titanium dioxide	5
Pigment	15
Preservative and perfume	q.s.
2—Talc	40
Starch glycerol	10
Sorbitol laurate	10
Zinc oxide	20
Sorbitol syrup	3
Mineral oil 65/75	1
Water	16
Color, perfume and preservative	q.s.
3—Bentonite U.S.P.	2.5
Titanium dioxide	2
Water	40
Glycerine	25
Propylene glycol	6
Carbitol	6
Triethanolamine stearate	3.5
Mineral oil 65/75	5
Color	10
Preservative and perfume	q.s.

A blemish covering preparation, the patent for which is outdated (7), consists of

2041 grams zinc oxide
720 cc distilled water
300 cc glycerine

This thick paste was then suitably colored. However, glyceryl monostearate 40%, triethanolamine stearate 40%, beeswax 10% and carnauba wax is a good starting point in formulating cake mascara.

To sum up, while glycerine is useful in formulating cosmetic creams it is important in compounding make-up products as well. It possesses plasticizing, moisturizing, spreading and fixative powers so necessary in make-up. Its lubricating and coupling action are not to be dismissed either. When used in sufficient concentration it is a preservative. One must not dispose of starch glycerol and glycerol gelatin too quickly as valuable glycerine modifications for use in make-up and other cosmetics.

REFERENCES

1. *Poucher, W. A., Perfumes, Cosmetics and Soaps, D. Van Nostrand Co., Inc., Princeton, N. J. (1936), Vol. 111.*
2. *Cerebelaud, R., Formulaire de Parfumerie, Vols. 11 and 111. Editions Opera, Paris (1951).*
3. *Heinrich, H., Cosmetics, Science and Technology edited by E. Sagarin, Interscience Publishers, Inc., New York, N. Y. (1957).*
4. *Velon, P., In Cerebelaud, see ref. (2) Vol. 111.*
5. *Brit. Pat. 454,970.*
6. *House of Westmore, Brit. Pat. 577,040 (1946).*
7. *O'Leary, Lydia, U.S. Pat. 1,877,952 (1932).*

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NOTHING TAKES THE PLACE OF . . .
Glycerine

"Doc, what sort of a disease is this side-effects I got now?"

Keeping Posted

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Orinase Volume

In recent testimony before the Kefauver Committee, Upjohn president, Dr. E. Gifford Upjohn, testified that Orinase, the oral diabetic drug, is now being used by well over a half-million diabetics. He also testified that the tablets cost the patient 12½ cents per tablet, so that the usual dosage of three tablets per day costs the patient 37½ cents per day. This figures out to $68,437,500 per year for 500,000 patients. Therefore, assuming that Upjohn's selling prices are at least half of this amount, Upjohn's annual business on the drug is close to $35 million.

Aspirin Volume Climbs

Aspirin manufactured in 1959 is estimated by Monsanto Chemical Company at 16 million pounds, or 22.4 billion five-grain tablets. This figures out to slightly more than 60 million tablets per day. Monsanto is increasing its output 25 per cent to keep pace with the rapidly increasing consumption of the drug, which has been climbing in recent years at a rate more than double that of the nation's population growth.

Aspro Nicholas Enters U. S. Market

Aspro Nicholas is entering the United States market through the purchase of Glidden Laboratories of Waukesha, Wisconsin. The purchase was made by Nicholas International of America Limited, U. S. subsidiary of Nicholas International Limited of Toronto, Canada. Glidden Laboratories, makers of ethical pharmaceutical products, is best known for its mineral oil laxative, Zymenol.

The Nicholas group has a long history in other parts of the world. The Australian branch markets its products throughout Australia, Asia, and the Far East, and has plants in Australia, New Zealand, and Indonesia. The English branch markets throughout Europe, Africa, and the Middle East, and operates plants in England, Ireland, France, Belgium, Holland, South Africa, Pakistan, and India. The U. S. company will serve North and South America, completing the world circle of Nicholas plants.

Outside the U. S., Nicholas is best known for its proprietary analgesic tablet, Aspro (containing 5 grains of aspirin). This product is sold in more than 100 countries. Nicholas also produces a wide range of veterinary products, including nutritional supplements and pharmaceuticals.

Lindsay C. Cuming, president of Nicholas International, says that the company plans to develop the Glidden operation as quickly as possible by intensifying the market of Zymenol, and by the introduction of products that have been developed in the Nicholas Institute for Medical and Veterinary Research, in England and Australia.

Lakeside's Imferon Off Market

Imferon, an intramuscular iron-dextran complex, originally from England and handled in this country by Lakeside Laboratories, a subsidiary of Colgate-Palmolive Company, has been withdrawn from the market on order of the Food and Drug Administration because it has been found to cause cancer in rats. The drug did not cause cancer in guinea pigs or rabbits. An estimate states that Lakeside's volume on this drug last year was $1.8 million, or 27 per cent of the company's sales.

Searle Enters Clinical Research

An animal products research department, headed by George E. Short, D.V.M., has been established in the research division of G. D. Searle & Co. The department will conduct studies to determine the possibility of utilizing in all phases of animal care compounds developed by Searle research.

Warner-Lambert and Syntex

Warner-Lambert Pharmaceutical Company has made an agreement with Syntex Corporation to distribute the trademarked dosage forms of Syntex "through Latin America, except Mexico, by Warner Lambert affiliated companies in that area." The

A MAN REQUIRES SPECIAL TREATMENT!

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products covered by the agreement are principally steroid hormones. The agreement marks Warner-Lambert's entrance into the steroid field.

Warner-Lambert has plans to double its research activities by construction of an addition to the Warner-Lambert Research Institute in Morris Plains, N. J., at a cost of $4 million. Research programs will be initiated in several new fields to keep pace with long-range planning for expansion of the company's ethical pharmaceutical lines.

Setting Tolerance for a Carcinogen

At the TGA Scientific Section luncheon, Dr. Bernard L. Oser of Food and Drug Research Laboratories made some observations about the "cancer clause," or the "Delaney amendment," which go straight to the heart of the problem. If a chemical food additive will cause cancer under any circumstances in man or other animal, then it may not be used in any amount in foods. The setting of tolerances for such substances is not allowed—it is said to be impossible to do so. But, said Dr. Oser, one of the newest additions to foods is Strontium 90, an undoubted and extremely potent carcinogen. Yet for this substance, the Atomic Energy Commission has "established" tolerances, and maintains that amounts present in foods are below harmful limits.

If it is possible for one government agency to set safe limits for a known carcinogen in one instance, then we fail to understand why another government agency is prohibited by law for far less dangerous materials that might be used in foods, or even in drugs and cosmetics.

Dental Visits Average 1.5 Per Person

During the two-year period, July 1957-June 1959, there were about 517 million dental visits or about 258 million a year, an average of 1.5 per person per year, according to a report on dental care (Series B-No. 15) published by the National Health Survey.

FDA to get Drug Reports from Hospitals

The Food and Drug Administration has set up a program under which a selected number of hospitals will promptly report unusual or adverse reactions from drugs they have used, particularly the newer drugs. Additional hospitals will be included, as the program develops, so as eventually to establish a nationwide reporting system. During the past four years the FDA has been testing the idea in a pilot study conducted in cooperation with the American Association of Medical Record Librarians, American Society of Hospital Pharmacists, the American Medical Association, and the American Hospital Association.

Soaps and Synthetics Up Again

Soap and synthetic detergent sales hit a new peak in the first quarter of 1960, according to reports from 58 manufacturers participating in the quarterly census of American Soap & Glycerin Manufacturers, Inc. Sales totaled 1,081,873,000 pounds, valued at $275,873,000, up 10.9 per cent in weight, and 10.6 per cent in value from the first quarter of 1959. Synthetic detergents accounted for 825,851,000 pounds valued at $201,029,000, an increase over the first quarter of 1959 of 12.7 per cent in quantity, and 12.2 per cent in value. Solid detergents totaled 664,067,000 pounds, and $146,264,000, a 7.4 per cent rise in quantity, and an 8.0 per cent rise in value. Liquid synthetic detergents totaled 161,784,000 pounds, valued at $54,765,000, up 41.3 and 25.2 per cent respectively, from the first three months of 1959. Synthetic detergents now constitute 76.3 per cent of quantity, and 72.9 per cent of value. Soap sales, which have been decreasing, showed an improvement. Sales totaled 256,022,000 pounds, a rise of 5.6 per cent, and value totaled $74,844,000, up 6.5 per cent.

Remington Medal to Ivor Griffith

Dr. Ivor Griffith, president of the Philadelphia College of Pharmacy and Science, is the 1960 recipient of the Remington Honor Medal. The Award Committee cited Dr. Griffith's accomplishments as a teacher, lecturer, author, and director in sciences related to pharmacy, and specifically noted that "Dr. Griffith has earned the Medal because of the cumulative effects of his efforts in behalf of pharmacy. He is a past president of the American Pharmaceutical Association, and has been a leader in community and educational affairs. His publications and his public addresses have attracted wide attention, both in the United States and abroad, and he has given freely of his time and talents in the promotion of the profession of pharmacy and the public health."

Dr. Griffith was born in Wales on January 3, 1891. He came to America in 1907.

Presentation of the Medal will be on Wednesday, December 7, at the Hotel Roosevelt, New York.

British Drug Houses' Oral Contraceptive

British Drug Houses, Ltd., has a steroid drug for oral contraception, which the company's chairman says may cost one penny a tablet, or one shilling, eight pence for a month's supply of 20 tablets. "A month's oral contraception for 1s. 8d. (less than a quarter of a dollar) is vastly cheaper than the 11 dollars quoted for a month's supply of the American steroids, Enovid and Norlutin," says the *Manufacturing Chemist*, London. "Cost is all-important for the success of oral contraceptives in those countries where birth control is most needed—India, China and so on."

The drug apparently is not being marketed as yet, and therefore, there might be at least a touch of Kefauver figuring in arriving at the price quoted.

In the *Lancet* of March 19, one doctor said that it

Coty **INCREASES SALES WITH AEROSOLS:** By packaging L'Aimant fragrance in aerosol form, Coty created a new "spray-mist" product that is outselling the original bottled L'Aimant toilet water 2 to 1!

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will be years before steroid contraceptives can be declared completely safe, and fears harmful effects, even cancer. Another doctor in the same issue declares that oral contraceptives offend against humanity on two counts: firstly they suppress the normal physiological function, and secondly they provide the opportunity for administration without the knowledge or consent of the recipient.

Regarding the purchase of British Drug Houses by Fisons, a British chemical company, negotiations have been abandoned. "A wit said that the marriage would not have been a happy one anyway because Fisons makes fertilizers and B.D.H. anti-fertilizers," says the *Manufacturing Chemist.*

Pharmacy Achievement Award to Dr. Blythe

Dr. Rudolph H. Blythe, director of pharmaceutical research at Smith, Kline & French Laboratories, received the Pharmacy Achievement Award of the American Pharmaceutical Association, Philadelphia Branch last month "for outstanding achievement in the correlation of research and practice in pharmacy." Dr. Blythe, who holds the patent on the first oral sustained-release products introduced by SK&F, joined the company in 1934 when he organized the firm's pharmaceutical research section.

American Society for Clinical Nutrition

The American Society for Clinical Nutrition was established last month with Dr. Richard W. Vilter, professor of medicine and chairman of the department, University of Cincinnati, College of Medicine, as the first president. Other officers consist of outstanding researchers on nutritional diseases: president-elect, Dr. Robert E. Olson, professor and head of the department of biochemistry and nutrition, University of Pittsburgh, Graduate School of Public Health; secretary-treasurer, Dr. Robert E. Hodges, associate professor of medicine, University of Iowa, School of Medicine. Elected to the governing counsel are: Dr. Willard A. Krehl, associate professor of medicine, Marquette University, School of Medicine, Milwaukee; Dr. Robert A. Goodhart, scientific director, National Vitamin Foundation; Dr. W. B. Bean, professor of medicine and chairman of the department, University of Iowa, School of Medicine.

The Society's membership will include medical and nonmedical scientists concerned with clinical research in nutrition in health and disease. The results of their work will be communicated to the medical and allied professions. Arrangements are being made to associate the Society with the American Institute for Nutrition.

SK&F Gets Medal for Psychiatric Aftercare

Smith, Kline & French Laboratories has been awarded the first annual Edward A. Strecker Memorial Medal for "outstanding service in the field of psychiatric aftercare," from Horizon House, Philadelphia, a center founded in 1953 under the name of Fountain House, to bridge the gap between a patient's release from a mental institution and his return to society on a permanent basis. The nonprofit organization provides social rehabilitation, individual counseling, and vocational services. A psychiatrically trained professional staff is available to patients at all times. The Strecker award was established after the death in 1959 of the Philadelphia physician, who gained national and international prominence as a psychiatrist, professor, and author of many books and papers on mental and nervous diseases. He was one of the first directors of Horizon House.

Miles' New Research Center

Miles Laboratories' new $3 million research center is said to represent a new concept in design featuring the twin objectives of unlimited communications among research teams and maximum flexibility in the use of laboratory space and equipment. The V-shaped, two-story center, with virtually no interior walls or doors, was planned to provide four open and flexible laboratory areas for any scientific project. Spaced along the open areas are four uniform concrete tubes—or columns—each containing all the plumbing, electric, and mechanical facilities needed for any laboratory project, permitting maximum flexibility of laboratory use and providing easy and unlimited communication among research teams. Further, the design eliminates laboratory obsolescence.

"The rapid change of today's scientific projects and the dual requirement of diverse skills and differing specialties demand the scientific team approach to the administration of medical research," said Dr. Walter A. Compton, Miles research and medical vice-president. "The new Miles Research Center utilizes space and equipment to suit any type of research, and it ties the man to the project rather than to a static laboratory design or to a permanent equipment setup of limited scope."

The simplicity of the design, with its uncomplicated open laboratory spaces, reduced the cost of the building to a third of that of the traditional design.

Norwich Radioisotope Laboratory

The Norwich Pharmacal Company recently placed in operation a modern radioisotope laboratory designed to study the action of the nitrofurans. The scientists will use radioactive carbon^{14}-tagged nitrofurin molecules in their studies of mode of action and disposition of the compounds in laboratory animals. A major question to be answered by this type of research is the length of time the nitrofurans remain in the bodies of animals after administration. These determinations are required by the Food Additives Amendment to the Food, Drug, and Cosmetic Act pertaining to veterinary drugs used on animals raised for food. Also, the scientists hope to develop

practical tests for determining drug content in animals during routine inspection in the field. Another goal is to develop new and better nitrofurans and new applications for presently available compounds.

Pfizer Grants Total $1,338,000

Chas. Pfizer & Co. and the Pfizer Foundation made grants for medical education and scientific education in 1959 totaling more than $1,338,000. Universities, medical schools, veterinary colleges, pharmacy colleges, and hospitals benefit from grants-in-aid amounting to $807,000. Investigations ranged from clinical evaluation of a new Salk-type polio vaccine to the testing of a new antidepressant compound. An additional $104,000 was received by students, resident physicians, and hospital and pharmacy internes under a continuing program designed to aid resident internes in completion of their education. Among these were graduate fellowships to aid students seeking advanced degrees in chemistry, biochemistry, pharmacology, and in other scientific areas.

Expenditures by Pfizer International affiliates for fellowships and other purposes amounted to $138,000 for aiding research studies in medicine, chemistry, and agricultural science. These included prize scholarships to graduate students in pediatrics and bacteriology at the University of Puerto Rico School of Medicine.

A total of $103,000 was allotted for consultantships and other services performed by outside research teams and organizations in collaboration with Pfizer scientists.

Contributions of $99,000 assisted groups that support medical and pharmaceutical education, emergency and relief organizations, and health and philanthropic groups in communities where Pfizer has plants, offices, and research facilities. A donation of $50,000 was made to the National Fund for Medical Education. Contributions by the Pfizer Foundation constituted an additional $86,000 for similar purposes.

Fleuroma on Dreyer Avenue

Fleuroma, Inc., producer of perfume compounds and specialties, is now located in a building it recently purchased at 43-23 Dreyer Avenue, Long Island City. N. Y. Probably due to the fact P. R. Dreyer, Inc., is in the same type of business, Fleuroma would like to have the name of the street changed to something like Fleuroma Avenue, or Fragrance Avenue. Queens Borough President Clancy is receptive to the idea and has asked New York City Councilman Frank V. Smith to introduce a bill in the City Council to bring about a name change. "I don't know how appropriate this name would be in this particular section," said Mr. Clancy. "But we want to attract industry to Queens, so an attractive name would be no more than a simple gesture of welcome to this business."

Dr. Welch Forced Out of FDA

Dr. Henry Welch resigned May 19, as chief of the division of antibiotics of the Food and Drug Administration following a demand from Health, Education and Welfare Secretary Arthur S. Flemming that he resign or be dismissed. The demand followed revelations by the Kefauver Committee that, in addition to his $17,500 salary from the FDA, Dr. Welch had collected more than $260,766 from other sources since 1953. This money came from his association with two publishing firms, MD Publications, Inc., and Medical Encyclopedia, Inc. He had a half interest in the latter firm worth $26,376.

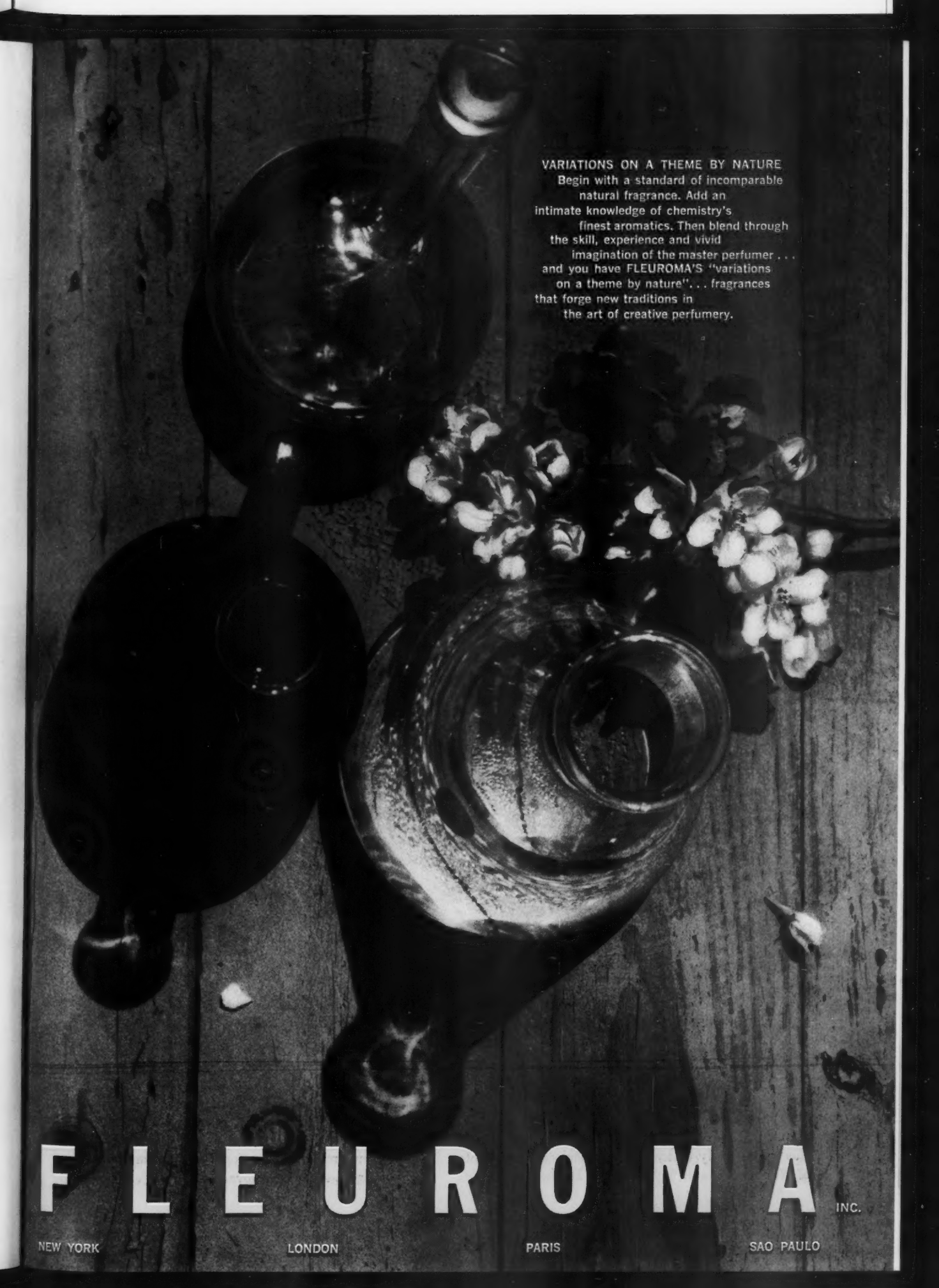
Documents obtained by the Kefauver Committee from the publishing houses showed payments ranging from $11,828 to $49,162 a year, between 1953 and 1959, to Dr. Welch. These payments came from MD Publications for work on the publications, *Antibiotics & Chemotherapy*, *Antibiotic Medicine & Clinical Therapy*, and *MD Magazine*. The documents indicated an unwritten agreement with MD Publications that gave Dr. Welch fixed shares of the profits on reprints of articles bought largely by drug manufacturing firms, on articles inserted after the magazine's deadlines, and on advertisements placed in the magazines by drug firms.

Dr. Welch had received approval of his outside work from his superiors in 1950 and 1954. However, memoranda from the FDA files, introduced at the Kefauver hearings, showed that his superiors were under the impression that he was to receive nothing more than the usual honorarium for his services. At no time, according to FDA, did Dr. Welch reveal the size of the payments.

When the question of possible conflict of interest involving Dr. Welch was first publicized generally, in the *Saturday Review* in February 1959, there followed a re-examination of the HEW rules on outside activities of employees, and issuance of a new policy statement last October sharply restricting these activities. Following this action, Dr. Welch was ordered to sever his connection with the publishing firms, which he did on January 1. Early in May, Dr. Welch filed an application for retirement from his government position because of disability resulting from a cardiac condition. His retirement was approved by the Civil Service Commission, to become effective June 1.

Lund Heads Proprietary Association

Joel Y. Lund, vice-president of Warner-Lambert Pharmaceutical Company, was elected president of The Proprietary Association last month. Two vice-presidents were elected: Ivan D. Combe, president, Eastco Division of Combe Chemical, Inc.; and Jerome A. Straka, president, Cheseborough-Pond's, Inc. Six members of the executive committee, with terms expiring in 1963, were elected: Walter R. Beardsley, president, Miles Laboratories; Robert R. Brown, ex-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ecutive vice-president, Bristol-Myers Company; Alvin G. Brush, chairman of the board, American Home Products Corporation; G. Lloyd Bunting, president, Noxzema Chemical Company; J. Mark Hiebert, M.D., chairman of the board, Sterling Drug, Inc.; and Richard D. Waters, president, Vick Products Division, Vick Chemical Company. One member, whose term expires in 1962 was elected: J. N. Cooke, president, Glenbrook Laboratories, division of Sterling Drug. Stanley I. Clark, vice-president, Sterling Drug, and Hermon A. High, vice-president, Vick Chemical Company, were elected honorary vice-presidents of the association.

Lipstick Color Exchange

An exchange of correspondence between S. L. Mayham, executive vice-president of the Toilet Good Association, and Dr. W. C. Hueper, Chief of Environmental Cancer Section, National Cancer Institute, points up the problems of communication. This becomes especially marked when one of the correspondents persists in proving points not in dispute and misreads the main point of the argument.

Dr. Hueper had been quoted in *Newsweek Magazine* as saying that coal-tar colors formerly known as Yellow AB and Yellow OB, and more recently as FD&C Yellow No. 3 and FD&C Yellow No. 4, were no longer permitted in foods but were permitted in lipsticks. Later, in *Science News Letter*, Dr. Hueper was quoted as saying that these two colors that are proven cancer-producing in man, are lipstick colors.

Mr. Mayham wrote Dr. Hueper stating: "We keep very careful records of colors which are used in lipsticks and these records do not show that these two colors have ever been used in lipsticks. These colors were decertified as FD&C colors in January 1959 and placed on the certifiable list as Ext. D&C Yellow No. 9 and Ext. Yellow No. 10. Ext. D&C colors may not be used in lipsticks under the present regulations of the Food, Drug, and Cosmetic Act. A subsequent order was issued January 1, 1960 under which two batches of these colors already in existence were decertified so that even stocks on hand cannot be used for food purposes, for internal drug purposes, or for lipstick purposes."

Despite this clear statement, Dr. Hueper in his response, confuses D&C colors with Ext. D&C colors, and then reasserts that even the small ingestion of dyes containing traces of beta-naphthylamine is potentially dangerous, even after he is told that they are not used in lipsticks. Beating a bag of old bones with a vengeance, Dr. Hueper then devoted several paragraphs to proving that beta-naphthylamine is dangerous, a point never in dispute. Finally he implies the belief that Yellow AB and Yellow OB may have been used in lipsticks because he saw lipsticks whose orange tint reminded him "of the color of the cheeses formerly colored with considerable amounts of Yellow AB and Yellow OB." He further asserts that they are being used in "chemically similar cosmetics, such as hair pomades" and therefore might have been used as oil-soluble dyes in lipsticks. Dr. Hueper concludes with a promise to clarify his statements in a forthcoming talk. It seems to us that if he cannot produce a lipstick which actually contains the harmful oil yellows, then he would be well advised to stay out of the lipstick color discussion.

Upjohn Facts

The Upjohn Company's research budget has risen from $4 million in 1950 to $15.2—9.7 per cent of sales—in 1959, and will be still greater in 1960, Upjohn president E. Gifford Upjohn told the New York Security Analysts last month. Medrol, an Upjohn steroid hormone, became the largest selling oral corticoid during 1959, and the company maintained its "number one position among manufacturers of corticoids for the second year with a growth rate slightly higher than the market," he said.

Orinase, Upjohn's oral diabetes agent, was being used at the end of 1959 by approximately one-third of the nation's known diabetics, "a substantial increase over the preceding year in spite of the fact that we now have two competitors who also market oral antidiabetes compounds, plus competition from the established market for insulin," said Dr. Upjohn.

Upjohn's antibiotic sales were up 10 per cent in 1959, with Panalba, the company's broad-spectrum antibiotic, showing the greatest gain. The company has great hope for Provera, a useful new progestational agent, which shows great promise in habitual and threatened abortion, as well as prevention of miscarriage.

Steroids, antibiotics, oral antidiabetic products, and antitumor or anticancer drugs are fields to which intense research attention is being given.

From Upjohn's broad research program came the antifungal antibiotic, Actidone, which was first thought to have possibilities in human medicine, but turned out to be promising in controlling fungus diseases of plants.

Lilly Appeals N. J. Fair Trade Decision

Eli Lilly and Company is appealing to the Supreme Court of the United States the recent judgment of the Supreme Court of New Jersey, which held that Lilly did not have access to the New Jersey courts in a fair trade case because it had not complied with the New Jersey foreign corporation qualification statute. The case involved a fair trade suit brought by Lilly against Sav-On Drugs, Inc., to stop violation of New Jersey's Fair Trade Act. The court held that because Lilly is a corporation of the state of Indiana and is not registered or qualified in New Jersey, it cannot use New Jersey courts to enforce its contracts. Lilly contends that its operations are wholly in interstate commerce and, therefore, New Jersey statutes do not apply, since they govern intrastate operations.

THE MARKET FOR PHARMACEUTICAL AEROSOLS*

BY HENRY F. HOLLOWAY GENERAL CHEMICAL CORPORATION, ALLIED CHEMICAL CORPORATION

The aerosol pharmaceutical industry is currently standing at an important crossroads in its brief, seven-year history. This is not unfamiliar ground to the rest of the aerosol industry, as virtually all product groups have passed this point. The crossroads represent a choice the aerosol pharmaceutical people must make as to whether to let their product continue to grow at its present, fairly impressive rate, or to get behind it and help it up to the tremendous potential sales rate of which it is capable. Although aerosol drugs and pharmaceuticals are one of the fastest-growing aerosol products, they are still way below their potential. The estimated $20 to $25 million registered in 1959 for aerosol pharmaceuticals represents only about 13 per cent of their present potential among topical drugs and pharmaceuticals alone. Based on a rather enthusiastic projection of past performance, it will take aerosols until 1963 or 1964 to capture even 50 per cent of this topical potential which, by that time, will be close to $200 million.

In the past five years, the total sales of all types of packaged medication have increased by approximately 57 per cent, from a value of $1.05 billion in 1954 to an estimated value of $1.65 billion in 1959. Total sales of prescription medications, on the other hand, have risen by about 105 per cent during the same period, from a total of approximately $0.99 billion in 1954 to a reported total of $2.01 billion in 1959. Figures reported to the Aerosol Division of the Chemical Specialties Manufacturers Association show that aerosol drugs and pharmaceuticals have grown from 1.1 million units in 1954 to 7.1 million units in 1958. Straight projection would make this an estimated 9.0 million units in 1959. Expanding these figures and converting to dollars, we see that, in 1956, aerosol drugs and pharmaceuticals accounted for approximately $3.8 million. In 1957, a rise occurred with the total dollar value going to $9.3 million. In 1958, the aerosol pharmaceutical industry grew to about $15 million and, in 1959, it reached an estimated $25 million.

Where the market can go from here is perhaps best determined by first investigating the advantages of aerosol pharmaceuticals and their possible potential future uses. The primary advantages of aerosol pharmaceuticals are:

1. Contents of the container remain sterile during the entire life of the container: This avoids contamination of medications as is often the case with nonaerosol products, especially products not sufficiently antiseptic themselves to remain germ free. A good example of this would be eye medications, which are apparently troublesome in this respect.

2. When using aerosols to apply topical pharmaceutical products, there is no danger of contamination of the product while applying it. This is especially true with ointments and salves, which most users have a tendency to spread with the fingers, or any spatula or tongue depressor that is handy.

(*Continued on page 840*)

*Presented at the mid-year meeting of the Chemical Specialties Manufacturers Association, May 1960.

COURTESY HARRIET HUBBARD AYER

TOXICOLOGICAL ASPECTS OF COSMETICS*

BY A. J. LEHMAN, M. D. DIVISION OF PHARMACOLOGY, FOOD AND DRUG ADMINISTRATION

It should not be necessary for me to remind this audience that cosmetic formulations can be very complex. There may be some virtue in the creation of a complex formulation; it undoubtedly baffles a competitor who attempts to emulate the product, but this complexity is conducive to complicating the problems of toxicity. As a rule, the simpler the formulation, the less it is apt to produce a multiplicity of adverse effects. No secret is revealed in noting that in the cosmetic field there has been a recent trend to employ pharmacologically active substances in the formulations. I believe that this is an unfortunate trend, and it, too, adds to problems of toxicity.

Our Food, Drug and Cosmetic Act is specific in its definition of a drug and of a cosmetic, and a concerted effort has been made by the Administration to maintain each in separate categories. Among the more common drug products introduced in cosmetics are antibiotics, hormones, vitamins, and antiseptics. Other drugs, such as the psoralens, have been administered orally to produce strictly a cosmetic effect, namely to obtain skin tanning. The incorporation of drugs in cosmetics poses serious problems of safety to users—problems which may outstrip research in our fundamental knowledge of skin physiology and toxicology. A fundamental reason for the Food and Drug Administration's effort to keep foods, drugs, and cosmetics in separate categories relates to usage and mode of administration. Unlike foods, cosmetics are intended generally for topical application. However, as in the case of foods and unlike most drug usage, cosmetics are often employed daily and during the greater portion of the individual's lifetime, that is, by the young, by the old, and even by individuals in varying conditions of stress (ill health). Whereas some adverse effects would be tolerated following the administration of an otherwise life-saving drug, no such adverse effects should be tolerated from the administration of a product for purely cosmetic purposes.

*Reprinted from the Proceedings of the Scientific Section of the Toilet Goods Association, No. 33, 1960.

General Toxicological Considerations

Cosmetic injuries may result from either local or systemic toxicity, or both. Our records show that the majority of cosmetic injuries result from local toxicity reactions, that is, resulting from either primary irritation, or sensitizations, or "skin fatigue." Our dermatological literature is replete with contradictory statements regarding the local injurious effects of cosmetics, particularly with reference to sensitization. It is most difficult to evaluate the significance of sporadic reports by physicians or authors of medi-

cal papers, since it is often impossible to correlate the incidence of injury with extent of exposure in the general population.

Although investigators usually take into account variations in species of laboratory animals, it sometimes happens that they do not seriously consider the wide variations that occur among individuals of the same species. Just as there are significant differences in the height and weight of individuals, there will be variations among individuals in their susceptibility to a poison. This is a normal biological function that may not be ignored, and must be considered the rule rather than the exception.

As stated above, the number and chemical nature of substances comprising a cosmetic formulation may be most complex. Time does not permit a discussion of the many and varied ingredients used as solvents, vehicles, and other components in cosmetic bases. However, for a number of specific reasons, surface-active agents are present in many cosmetic formulations. It is important that limits of tolerance for these agents be predetermined for the skin (intact and damaged) and for any mucosa these may contact during normal or customary usage.

A recent recall program was necessitated for a hair-waving preparation in which the neutralizer, if it accidentally reached the eye mucosa of the user, produced serious acute damage. The surface-active agents in this neutralizer were responsible for the injuries. In this particular case, the surfactants also produced strong local anesthetic effects in the eye mucosa. The local anethesia is an undesirable property in such a preparation, and is an insidious effect, since the affected person does not become aware immediately of his injury and may thereby delay remedial measures.

Most surfactants are complex condensation products of no fixed chemical composition, which are characterized by their physical properties and broadly classified on the basis of their ionizing characteristics; for example, as anionic, cationic, and nonionic agents. Their toxicological properties vary greatly, and, although there is considerable overlapping, in general their order of toxicity is cationic > anionic > nonionic.[1, 2]

Hair-Waving Preparations

The active ingredients of hair-waving preparations must be capable of producing chemical and physical alterations in the structure of the hair to produce waving.[3] Any agent capable of producing such pronounced changes in the hair shaft may also profoundly affect the epidermis itself, even to the point of producing systemic effects with extensive exposure.[4, 5]

The majority of hair-waving preparations in use today employ mercaptans as the active waving ingredient, usually salts or derivatives of thioglycolic acid. A review of our files on reports of injuries following the use of these preparations reveals that approximately 80 per cent refer to a dermatitis similar to a simple chemical burn. An occasional report is received in which the use of a hair-waving preparation is associated with the development of a blood dyscrasia. Our Skin Toxicity Branch has investigated this problem and has been unable to establish that a relationship exists between the topical administration of hair-waving preparations and the development of a blood dyscrasia.

The fact that millions of units of these products are used annually and reports of blood dyscrasias have been so few, would justify the conclusion that the occurrence of blood disorders in users is purely coincidental. (*Continued on page 847*)

COURTESY GERMAINE MONTEIL

J. W. Haefle (left), a recipient of the CIBS Award, with L. M. Scovill.

TGA SCIENTIFIC SECTION MEETING 1960

More than 600 attended the spring meeting of the Toilet Goods Association Scientific Section, held at the Waldorf-Astoria in New York on May 11, 1960. The luncheon featured the presentation of the CIBS award for the most meritorious paper presented in the preceding year at the TGA Scientific Section meetings. The award was made by Lamson M. Scovill, president of CIBS, to J. W. Haefle and R. W. Broge of the Toilet Goods Division of Procter and Gamble, for their paper, "The Synthesis and Properties of Mercaptans Having Different Degrees of Acidity of the Sulfhydryl Group."

Officers of the Scientific Section are Walter W. Edman of Evans Research & Development Corporation, chairman; Dr. Herbert Heinrich of Coty Products Corporation, vice-chairman; and H. D. Goulden of the TGA, secretary; with Donald Dean of Shulton,

Bernard L. Oser of Food and Drug Research Labs., Inc., a speaker.

Walter W. Edman (left), chairman of the Scientific Section and speaker. Lloyd W. Hazelton (center), Hazleton Labs., and Herbert Heinrich, Coty.

Inc., as vice-chairman elect. Papers were presented by Dr. Bernard Davidow of New Drug Institute, Dr. Bernard L. Oser of Food and Drug Research Laboratories, Inc., Dr. Lloyd W. Hazleton and Dr. John R. Elsea of Hazleton Laboratories, Dr. A. J. Lehman of the Food and Drug Administration, Dr. Herbert Heinrich and John E. Clements of Coty, Inc., Dr. James W. Johnston, Jr. and Armando Sandoval of Georgetown University, and Dr. Edward J. Masters of Helena Rubinstein.

Dr. Bernard Davidow, "Program for Dermal Toxicity Testing," asserts that, before marketing, a new toilet preparation should pass a series of tests designed to evaluate its safety. Tests using animals, and then human volunteers, should answer the following questions: Will the compound being tested prove injurious to the human user; to what degree and extent may injury be anticipated; what is the form of injury—sensitization, irritation, or systemic toxicity; will the damage be repaired on cessation of use; what are the consequences of special or unanticipated use, such as accidental ingestion or contact with the eyes; what is the margin of safety in case of excessive dosage? Because of the many new chemicals and their ingenious application, no single pattern of tests can provide the necessary evidence of safety. Many tests, however, are useful for evaluating irritation, sensitization, and systemic toxicity. Of paramount importance are the qualifications of the pharmacologist who designs, conducts, evaluates, and interprets the data.

Dr. Bernard L. Oser, "The Rationale and Interpretation of Toxicity Tests," discussed the fact that

(*Continued on page 812*)

Speakers: James W. Johnston, Jr., Georgetown University (l.); A. J. Lehman, Food and Drug Administration (c.); Edward Masters, H. Rubinstein.

AEROSOL INHALATION THERAPY*

BY JOHN J. SCIARRA, Ph.D., and VINCENT de PAUL LYNCH, Ph.D.
ST. JOHN'S UNIVERSITY, COLLEGE OF PHARMACY, JAMAICA, N.Y.

Inhalation therapy may be defined as the administration via the respiratory system of medicinal agents which are in the form of fine solid particles or a liquid mist. This method of administration is not new. The ancients recorded the efficacy of the vapors from burning leaves and herbs; within the past 30 years, the smoke from burning stramonium leaves has been used in the treatment of asthma. In more recent times, physicians have administered penicillin and other antibiotics by way of the respiratory tract. While this form of therapy is useful for its local effects, it also produces systemic effects, that is, effects which occur because of absorption of the drug into the general circulation. The nature of the respiratory system is such that it permits the prompt absorption of many drug agents, so that it can be said that inhalation therapy almost approaches intravenous therapy in the rapidity of its onset of action.

The rationale behind the treatment of disease with drugs lies in first finding a substance which will alter the condition, and then getting the material to the affected site in an adequate concentration as rapidly as possible. If it is assumed that drugs are available, then the problem resolves itself into one of methods of administration and absorption.

Under ordinary circumstances, drugs may be applied topically, administered orally or rectally, or given by injection. How much of the drug and how fast it reaches the circulation depend upon the rate and amount of absorption. In the case of topical application (application to skin surfaces) both rate and amount of absorption would probably be rather small. This is readily understandable, considering the physical barrier presented by the skin surface, and the fact that many other factors including the physical properties of the drug, the distribution of hair follicles and surface pores (through which the material is chiefly absorbed), and the properties of the vehicle are involved in delaying the process.

The use of the rectal or oral route of administration also depends upon the amount of drug absorbed, in this case, by mucosal surfaces. The physical skin barrier is absent, and the material is in closer contact with the circulatory system. However, the drug must be capable of withstanding the digestive onslaught of the stomach and intestine. Furthermore, absorption must take place in the presence of peristaltic movement and, usually, in spite of an adverse concentration gradient.

Administering a drug by injection technique overcomes many of the objectionable facets of oral and topical dosage, while introducing other objections. The most decided disadvantage is the fact that sterile technique, equipment, and materials are necessary, and the injection must be made by a specially trained person, usually not the patient.

In the case of intravenous administration, even a nurse or doctor sometimes encounters difficulty. And in addition, most injections are accompanied by some degree of discomfort. There is the possibility too, especially in the case of intramuscular or subcutaneous injection, that the material will be incompletely absorbed and that a sterile abscess will result.

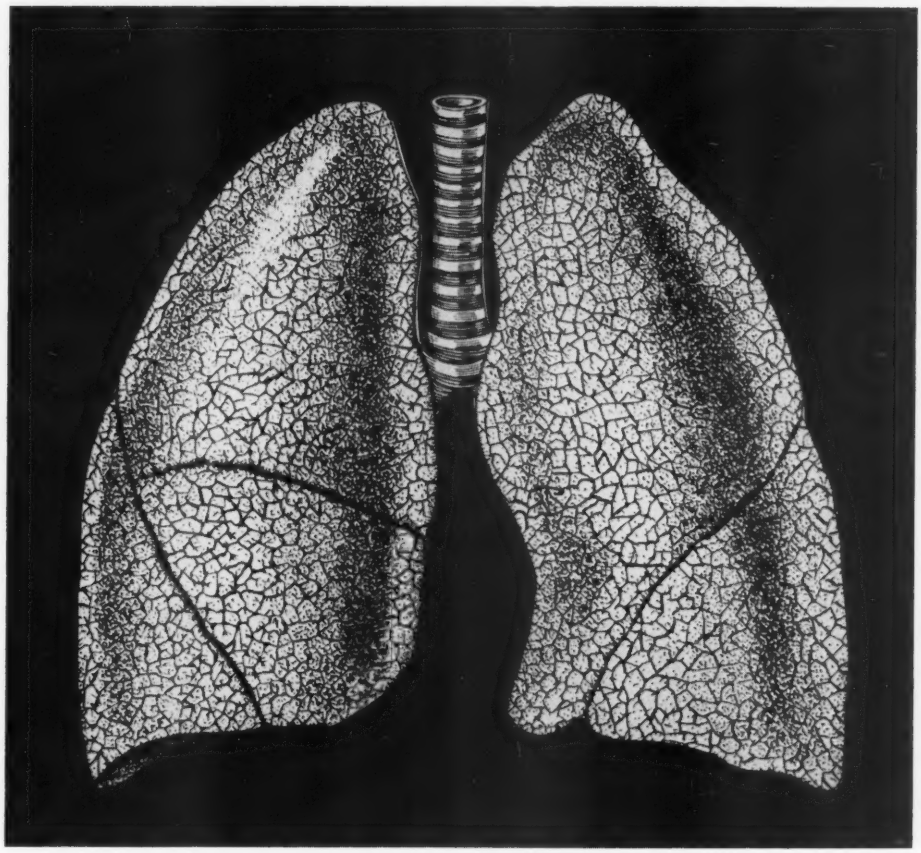
In light of these facts, it would be well to discuss the respiratory system before discussing the advantages and disadvantages of aerosol therapy.

The respiratory system or tract consists of the nasal passages and the mouth opening into the pharynx, the larynx, the trachea, the bronchi, and the lungs.

Air enters the nose or mouth, passes into the pharynx and thence into the larynx. The larynx and pharynx are separated from one another by the epiglottis, which permits the passage of air or materials suspended in air, but prevents the passage of liquids or solids into the larynx during the swallowing process. From the larynx, air enters the trachea, which divides to form the upper bronchi. Smaller air passageways, called terminal bronchioles, arise from the bronchi. These terminal bronchioles subdivide into respiratory bronchioles which give rise to the alveolar ducts (5 or 6 per bronchiole). After branching a variable number of times, each alveolar duct terminates in several alveolar sacs (3-6), the walls of which contain pouch-like structures termed pulmonary alveoli. From the area of the respiratory bronchioles to the pulmonary alveoli, true respiratory function occurs, that is, exchange of gases takes place.

From the oral and nasal cavities to the terminal bronchioles, these structures are for the most part

*Presented at the midyear meeting of the Chemical Specialties Manufacturers Association, May 1960.



lined with mucosal tissue well supplied with arteries and veins. Thus, the surface they present to materials to be absorbed is similar to the lining of the stomach or intestine. However, there are also cilia, or hair-like projections present which beat rhythmically and tend to propel the sheet of mucous which envelopes them in the direction of the mouth. This is the mechanism whereby the body entraps and expels foreign particles entering the respiratory passageways with atmospheric air. Not all suspended materials are eliminated in this way, the limiting factor being the size and mass of the particle, and the diameter of the air passageways. The latter is less important than the former when it is considered that the mechanism for removing particles from the air is so efficient that most particles larger than 5 microns in diameter are prevented from entering the lungs by this means. On the other hand, the smallest respiratory unit, the alveolar duct, has a diameter of about 200 microns. There is, of course, a minimum to the size of a particle that will be retained within the alveolar sac. Thus, those particles that tend to remain suspended within the alveolar air would be expelled during expiration, those particles usually smaller than 0.5 microns. Particles between these limits (0.5 to 5.0 microns) would tend to fall against the alveolar walls and mix with the alveolar fluid.

A factor which contributes greatly to the respiratory function of the lung is the thickness of its walls. From the respiratory bronchiole to the alveolar sac, these walls consist of thin connective tissue in close contact with underlying blood vessels. In fact, the walls of the pulmonary alveoli consist of a single layer of epithelial cells with a single capillary between adjacent alveoli, so that, in most instances, material in the alveolar cavity is separated from circulating blood by only two membranes, the alveolar and the capillary walls. The area of the exchange surface of the lung must also be considered. This is estimated to be about 55 square meters or about 25 times the surface area of the skin. If it is kept in mind that this is also the area of the available adjacent blood supply, the rapidity of absorption in this area will be more readily understood.

Very simply then, it might be stated that if a drug meets a few physiological criteria, it would be suitable for use in aerosol inhalation therapy.

From the point of view of the pharmacologist, one of the most important considerations in the usefulness of a drug substance is whether or not the material is soluble in body fluids and, therefore, capable of being absorbed. Thus, a drug to be given by inhalation therapy must be soluble in natural secretions. Very

(*Continued on page 810*)

Eulogist Earle Arnow; Award winner A. B. Lerner; Pres. H. J. Amsterdam.

SCC MIDYEAR 1960 MEETING

At the luncheon session of the 1960 semi-annual meeting of the Society of Cosmetic Chemists, held at the Biltmore hotel on May 12, the Society's Special Award was presented to Dr. A. B. Lerner. The meeting, again, was the most successful to date, about 500 attending the sessions and luncheon. The program was organized by E. Allen Newcomb and included papers by Dr. G. Robert Clark of the Food and Drug Administration, Dr. Norman Orentreich, Dr. William Colburn of Colburn Laboratories, Inc., Dr. Sidney Riegelman and R. L. Penna of the University of California School of Pharmacy, Herman Bogaty of the Toni Company, Dr. Herbert C. Stecker of Stecker Chemicals, Inc. and Dr. Richard E. Faust of Potter Drug & Chemical Corp., and Robert James and R. L. Goldemberg of Shulton, Inc.

Some participants in the program: E. Allen Newcomb; Dr. G. Robert Clark; Dr. Herbert C. Stecker; H. J. Amsterdam; Dr. Richard E. Faust; Dr. Sidney Riegelman; Dr. William Colburn; and Robert James.

Presentation by President Amsterdam of award scroll to A. B. Lerner.

Dr. Sophie L. Plechner, president-elect; E. Arnow; and Dr. Lerner.

H. J. Amsterdam, president of the Society, at the end of the morning session, introduced Dr. Hermann Wilmsmann who conveyed the greetings of the German Society of Cosmetic Chemists. After lunch, Mr. Amsterdam presented Dr. Sophie L. Plechner, president-elect, who introduced the eulogist, Dr. L. Earle Arnow, president of the Warner-Lambert Research Institute. Dr. Arnow described the life and accomplishments of the award winner, who then received the scroll and check from Mr. Amsterdam. Dr. Lerner, of the Yale University School of Medicine, made a few observations on the nature and consequences of his work on skin pigmentation.

Dr. Norman Orentreich, in "The Pathogenesis of Alopecia," which he liberally illustrated with slides, covered generally the causes of hair loss in men, the causes of hair loss in women, reviewed the use of steroids in the treatment of certain alopecias, and discussed the influence of cosmetics on hair loss.

Dr. William Colburn, in "Assay of Lyophilized Human Placenta Extract," described an assay method based on alkaline phosphatase enzyme activity and critically evaluated the effects of variables. Assay results may be affected by other ingredients, preservatives, solvents, antioxidants, and cosmetic components, and these factors were discussed.

Dr. Sidney Riegelman and R. L. Penna discussed the "Effect of Vehicle Components and Sebum Constituents on the Absorption Characteristics of Sun Screens." In evaluating the relative screening action of sunscreening compounds, the solvent has an important effect, since its dielectric constant and hydrogen bonding have a profound effect on the polarizability of the sunscreen and on its ability to absorb in the ultra-violet region. Investigation revealed that in

(Continued on page 836)

Speaker Dr. G. Robert Clark of the Food and Drug Administration.

E. Allen Newcomb, who served as program chairman for the meeting.

Past presidents of the American Society of Perfumers: Jacques Masson, Pierre Bouillette, Ernest Shiftan, A. T. Frascatti, and Oliver Marton.

E. R. van Liew, who spoke on fragrance and the American male.

Edward S. Maurer of England receiving Honorary Membership in the American Society of Perfumers, Inc., from President Bernard Polak.

AMERICAN SOCIETY OF PERFUMERS' SIXTH SYMPOSIUM

The Sixth Annual Symposium of the American Society of Perfumers took place at the Essex House, New York City, on April 28, 1960 and was followed by a cocktail hour and buffet dinner. More than 300, including a number of top executives, were welcomed to the most successful meeting yet held by the Perfumers, by Bernard Polak, president of the society, and Walter Lengsfelder, symposium chairman. Honorary membership in the society was

Speakers: Walter Lengsfelder, E. R. van Liew, E. S. Maurer, O. L. Marton, Alfred H. Moeller, Bernard Polak, Fred C. Theile, Frazer V. Sinclair.

Thomas Cifelli, Jr., who addressed the group on perfumes and patents.

Dr. Oliver L. Marton whose topic was pitfalls in perfumery.

Alfred H. Moeller speaking on temperament's effects on odor selection.

conferred upon Edward Maurer of London, England by Mr. Pollak in recognition of notable accomplishments in the field of perfumery. Frazer V. Sinclair of DRUG AND COSMETIC INDUSTRY and BEAUTY FASHION moderated the active discussion period. Papers were presented by F. C. Theile, D. Dean, and R. Suffis of Shulton, Inc.; E. R. van Liew of Givaudan-Delawanna, Inc.; Alfred H. Moeller of Noville Essential Oil Co., Inc.; Dr. Oliver L. Marton of Shulton, Inc.; Thomas Cifelli, Jr., of Richards and Cifelli; and Walter Lengsfelder of Fleuroma, Inc.

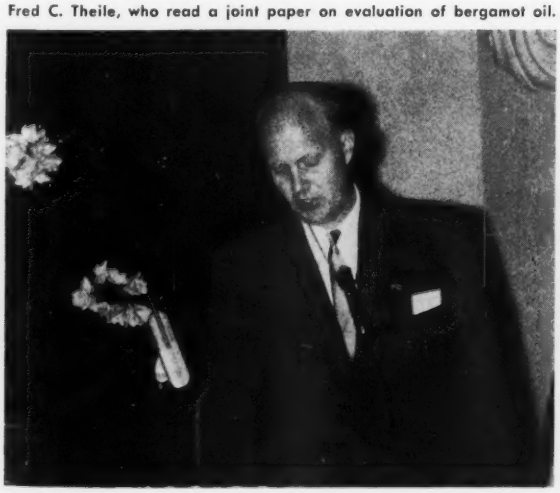
Fred C. Theile and co-authors presented a paper, "A Modern Approach to the Evaluation of Bergamot Oil." Ultra-violet and infra-red spectrophotometric and vapor-phase chromatographic techniques were used to provide accurate and rapid means for detecting and identifying additions to natural bergamot oil. These replace, and are better than wet chemical methods of analysis and provide means of determining percentages of the original oil present in mixtures. Examples were given of bergamot oils that were within N. F. specification limits but contained foreign additions or added proportions of natural components.

E. R. van Liew discussed "Fragrance and the American Male." A number of interesting paradoxes in the male attitude toward toiletries were cited and it was suggested that men are slowly accepting fragrances at least in functional products. Men's and women's odors may differ only slightly, but these differences are subtle and important.

Alfred H. Moeller expounded on "The Influence of Human Temperament in Odor Selection." The question was raised whether consumer tests can be relied upon when testers are picked at random from a segment of the buying public. Panel tests indicated that olfactory acuity is far from universal and that people who show a genuine interest in fragrance are in the minority. The speaker took the position that we are partially influenced by instinctive likes and dislikes with regard to odors. Therefore, an individual does not select odors solely in accord with his acquired tastes, and differences of taste between

(*Continued on page 837*)

Fred C. Theile, who read a joint paper on evaluation of bergamot oil.



Walter Lengsfelder discussing the abstract concept in perfumery.

Presented at the annual open symposium of the Society of American Perfumers, April 1960.

THE EVALUATION OF BERGAMOT OIL

BY F. C. THEILE, D. E. DEAN AND R. SUFFIS
SHULTON, INC.

Bergamot oil is one of the major constituents of many of our fragrances at Shulton. Since it is a highly competitive article of commerce, we have concentrated on finding methods which will give us a reliable and rapid yardstick by which to judge this important commodity.

A comprehensive study of several dozen samples of bergamot oil from various sources has been made in our laboratories. Some of the samples we have examined bordered on, or fell outside the N. F. requirements,[1] but we have also encountered oils that met N. F. specifications, which varied widely in such characteristics as price, odor, and color. This aroused our curiosity as to the possibility that they were other than natural bergamot.

Formerly, it was not difficult to ascertain the purity of bergamot oil, since any additions greatly altered the physical constants. Today, due to the great variety of natural isolates, terpenes, and synthetic aromatics available, it is relatively simple to prepare additives that cannot be detected in a routine analysis.

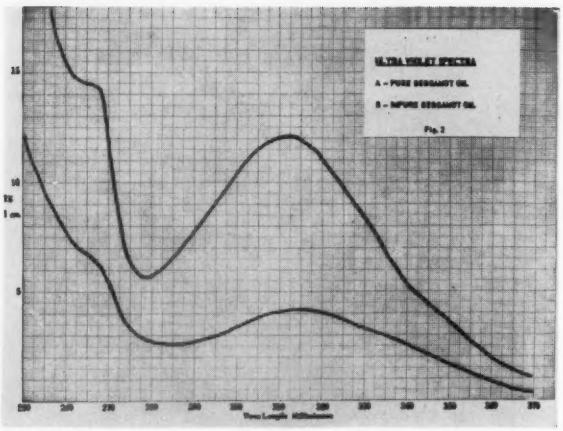


FIGURE 2

The N. F. specifications, with which you are all familiar, include testing for simple chemical and physical properties. To these tests we have added the techniques of ultra-violet and infra-red spectroscopy and vapor-phase chromatography for the detection of possible adulteration.

Spectrophotometric studies in connection with bergamot oil have been reported in the literature.[2, 3] We are not advocating new methods of analysis for this material, but we have integrated spectrophotometric and chromatographic data with the N. F. tests in an effort to obtain a truer evaluation of quality.

Of course, the final determination as to the quality of bergamot oil as well as all other fragrant materials is left to the trained nose of a perfumer. His olfactory opinion, together with the above mentioned analyses, provide sufficient data which, when correlated with price, provide a sound basis for final judgment of the oil.

FIGURE 1

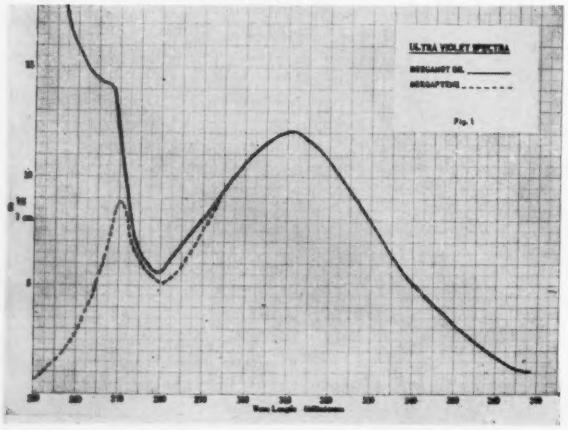
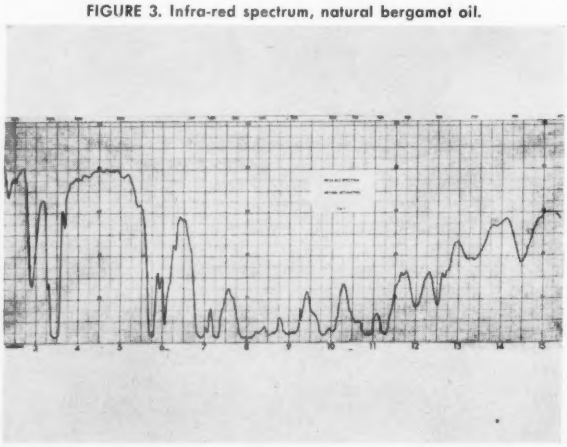


FIGURE 3. Infra-red spectrum, natural bergamot oil.



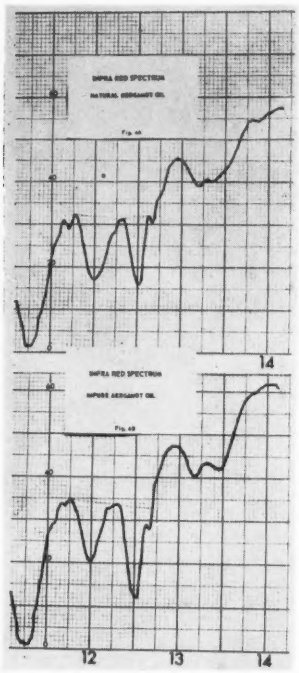


FIGURE 4. Infra-red spectrum (a) natural oil, (b) impure oil.

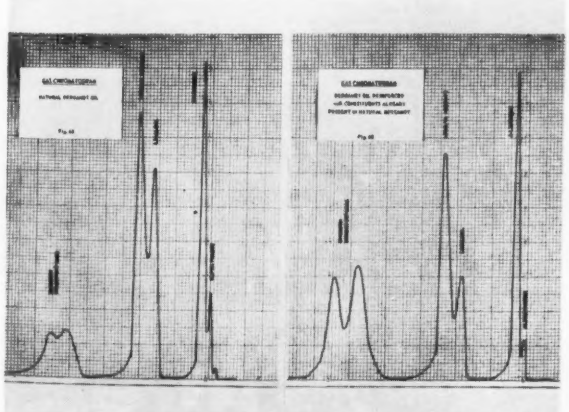
According to Guenther, bergamot oil contains principally 35 to 45 per cent linalyl acetate, 20 to 30 per cent linalool, 63 to 70 per cent combined alcohol and ester, approximately 5 per cent bergaptene, 25 to 35 per cent alpha-pinene, d-limonene, and miscellaneous terpenes.

In our investigations we have observed variations of the components. They fall into two general types:

FIGURE 5
Bergamot Oil
Vapor Phase Chromatography—Area Percentages

Component	Range
Alpha pinene	7-10
d-Limonene	39-46
Linalool	17-24
Linalyl acetate	22-30

FIGURE 6. Gas chromatogram, bergamot oil (a) natural, (b) reinforced.



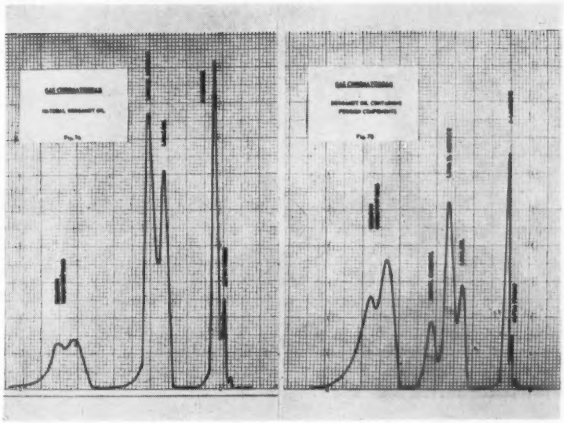


FIGURE 7. Gas chromatogram, bergamot oil (a) natural, (b) with foreign components.

1. Addition to natural bergamot of one or more of its components, that is, linalyl acetate, linalool, limonene, or other terpenes that cost less than bergamot itself.

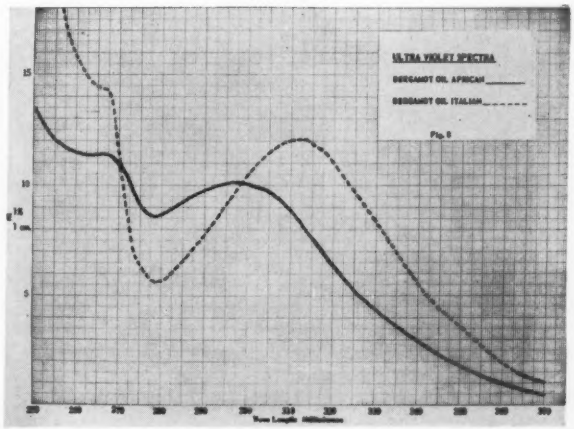
2. Dilution of natural bergamot with a synthetic inert substance such as p-cymene, carbitols, and high molecular weight esters.

We found the ultra-violet spectrum extremely valuable in recognizing natural bergamot oil. Bergaptene, a coumarin derivative which accounts for the bulk of the residue on evaporation of bergamot oil, has absorption maxima at 270 mμ (2700 Angstroms) and 312.5 mμ with a minimum at 281 mμ. (Figure 1. For comparison the bergaptene is shown in the same concentration as it appears in bergamot oil.) Although the peak at 270 mμ is almost completely obscured by the end absorption of linalyl acetate, the 312.5 mμ peak is well defined. Specific extinction coefficients, that is, the absorption of a 1 per cent solution in a 1 cm. absorption cell at this wave length, vary from 10 to 13 for natural bergamot.

Diluted bergamots have lower extinction values depending on the extent of dilution, as extinction

(Continued on page 837)

FIGURE 8



USEFULNESS OF RHEOLOGY IN COSMETICS*

BY HERBERT HEINRICH
AND JOHN CLEMENTS COTY, INC.

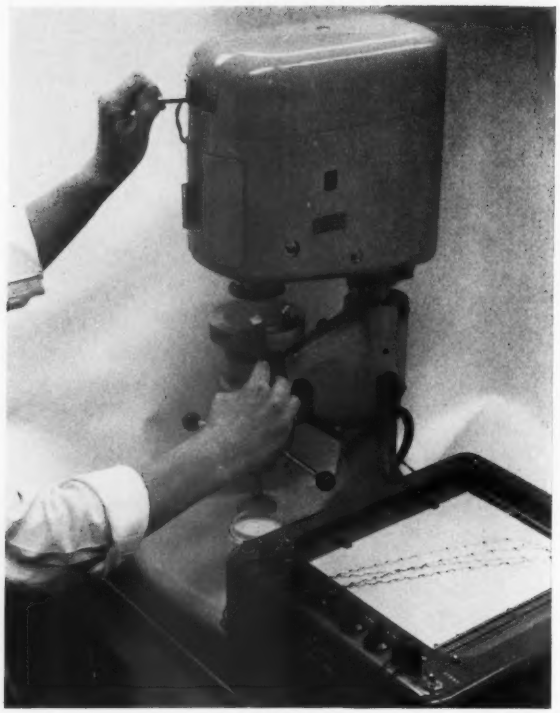


FIGURE 1

For years, cosmetic chemists have been aware that the viscosity and, in its broader scope, the rheology of a cosmetic emulsion are significant physical characteristics. In spite of its recognized importance, information on rheology has been primarily academic and of little use to the cosmetic chemist who tried to tackle the measurement of this involved physical property with inadequate equipment.

Until a few years ago, even if one was willing to spend a great deal of money, time, and effort to develop or purchase a suitable apparatus, the resulting instrument turned out to be a research tool too delicate and slow for routine work.

Recently however, a cone and plate viscometer has become available which is both rugged and very precise. The instrument, equipped with a programmer and a recorder, has been used to study variables en-

FIGURE 2

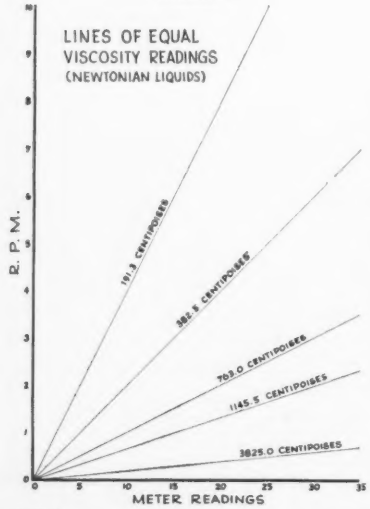


FIGURE 3

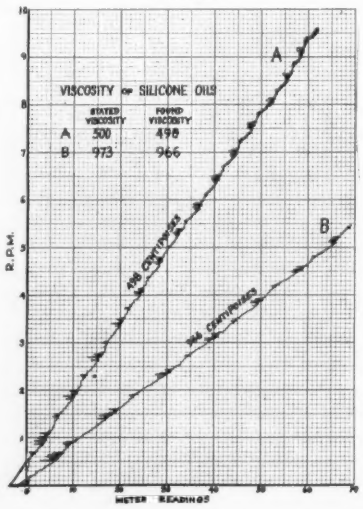
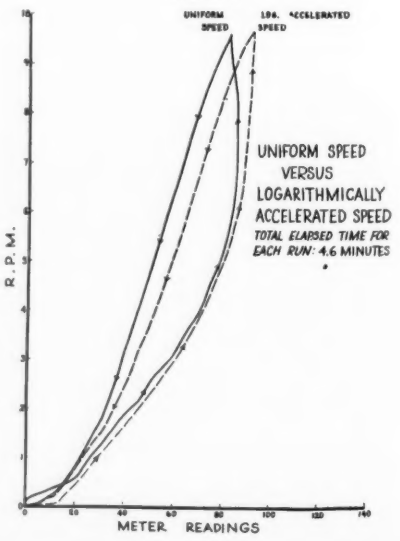


FIGURE 4



*Reprinted from the Proceedings of the Scientific Section of the Toilet Goods Association, No. 33, 1960.

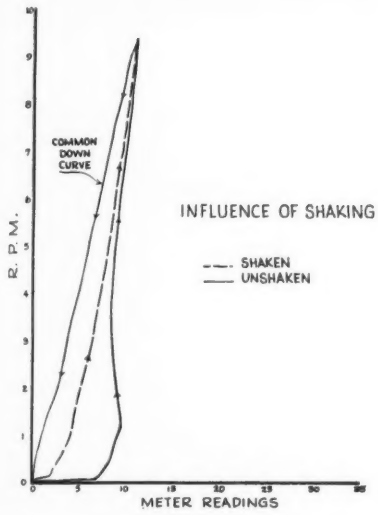


FIGURE 5

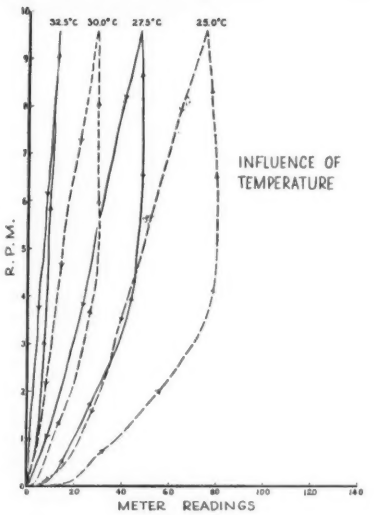


FIGURE 6

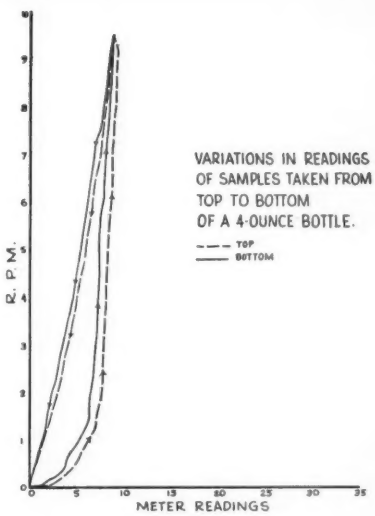


FIGURE 7

countered in making and storing cosmetic emulsions.

The basic instrument is the Ferranti-Shirley Viscometer (Ferranti, Hempstead, Long Island) equipped to cover the 0 to 10 r.p.m. range, a logarithmic rate of shear programmer, and an X-Y recorder. Figure 1 shows the instrument and the recorder. The theory of the measurement and the details of construction of the instrument have been fully discussed by McKennell. (R. McKennell. 1956. Cone-plate viscometer. Anal. Chem. **28:** 1710-1714.)

Briefly, the advantages of the instrument are:

1. It covers the range significant for cosmetic emulsions.
2. It requires less than one gram of sample.
3. It is temperature controlled.
4. It is fully automatic.
5. It is easy to place the sample, to clean, and to operate.
6. It is relatively fast (all 0 to 10 r.p.m. curves reported in this paper took 8 to 9 minutes for the complete up and down runs).

We have found a few shortcomings in the instrument:

1. It does not measure the viscosity of a thin liquid such as water.
2. It does not work with very tacky preparations.
3. It does not work reliably with liquids which contain some firm particles that are larger than the gap between cone and plate.

To make a determination, simply place a small quantity of the product on the bottom plate, which is then raised until it is just off the cone, and the programmer is started. The programmer advances the acceleration of the cone logarithmically from 0 to 10 r.p.m., reverses it automatically, decelerates it logarithmically, and stops when the cone reaches 0 r.p.m. again. *(Continued on the following page)*

FIGURE 8

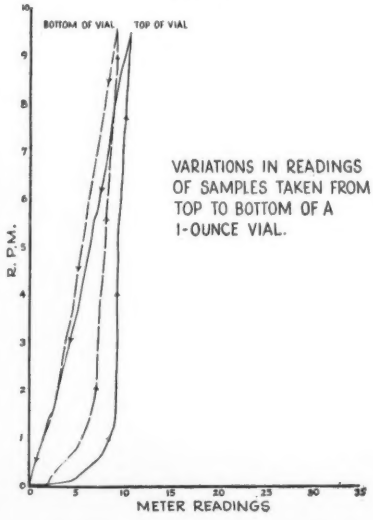


FIGURE 9

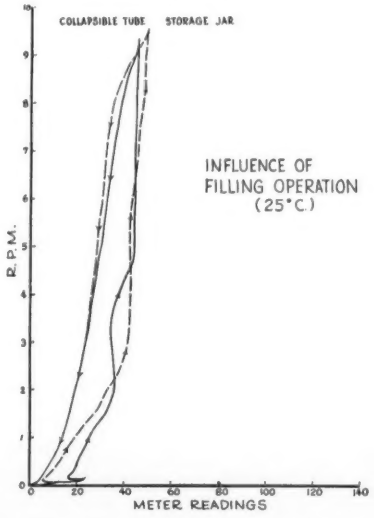
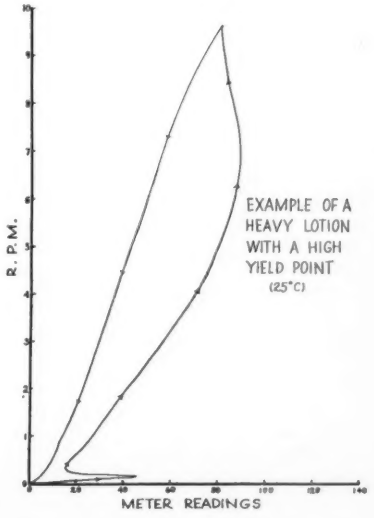


FIGURE 10



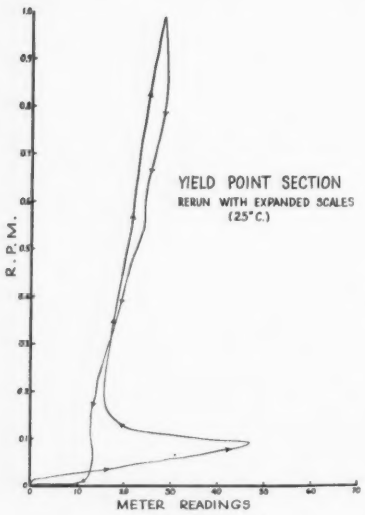


FIGURE 11

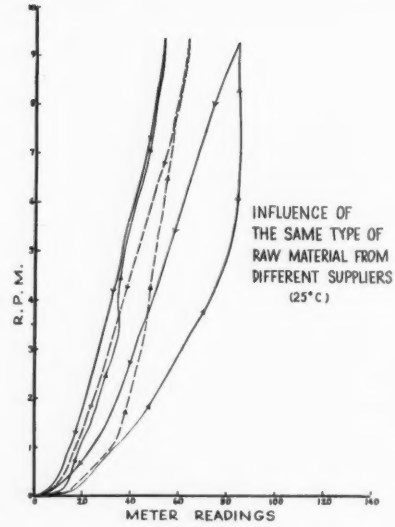


FIGURE 12

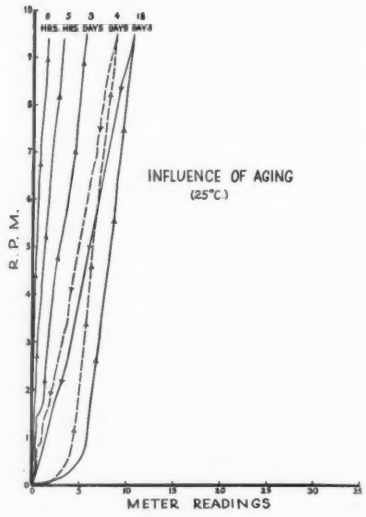


FIGURE 13

The results are plotted as r.p.m. of the cone versus meter readings. To plot the results as rate of shear versus shear stress does not add anything to the understanding, because it seems to convey a certitude of properties which does not really exist. Furthermore, simple arithmetic factors change r.p.m. into rate of shear and meter readings into shear stress.

We could have plotted the results as viscosity versus rate of shear but, again, we wanted to break away from the idea that an emulsion has one definite viscosity for each temperature. In reality, the value for the viscosity of an emulsion is a function of the conditions of the measurements. It should be emphasized that Newtonian liquids are independent of the conditions of measurements as long as the temperature remains constant.

Figure 2 shows lines of equal viscosities in the coordinate system which we have chosen for our presentation. It will be noted that the high viscosity readings are more or less horizontal and the low readings are more or less perpendicular.

The viscosity curve of a true Newtonian liquid really follows a straight line (Figure 3). This photograph gives an idea how the recorded graphs actually look. The irregularities along the graphs are due to electronic noise. The calculations in centipoise require that the intercept of the curve with the horizontal axis be considered as the corrected zero point for all meter readings. This is necessary because it takes a small but definite force to overcome the inertia of the viscometer spring.

Quite some thought was given to the selection of the best principle of accelerating the cone. It was decided that a logarithmic change of shear rate would be both convenient and rapid. Figure 4 shows the

(Continued on page 851)

FIGURE 14

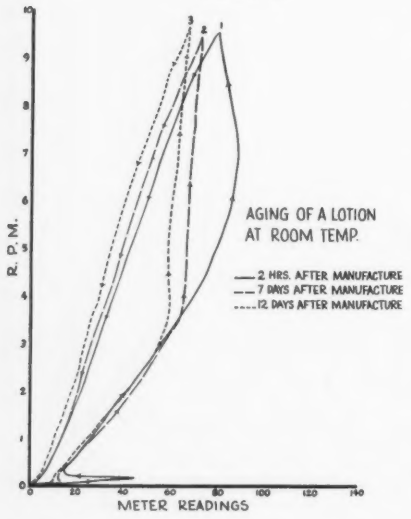


FIGURE 15

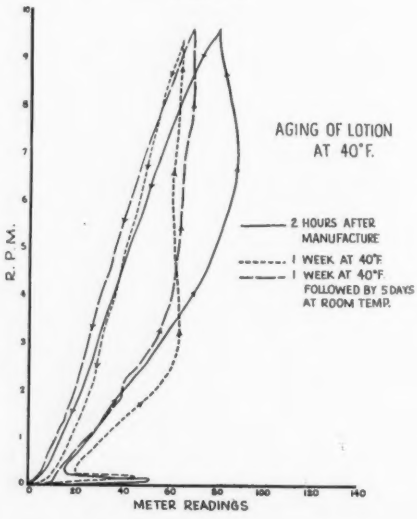
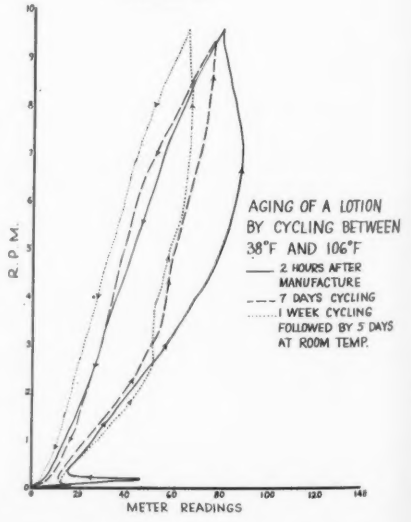


FIGURE 16



Packaging and Selling

Prop, new electric pre-shave lotion
from Mennen Company. Glass bottle by Carr Lowrey Glass Company is clear to show sea-blue lotion color, simulates an electric shaver, is capped with a shaver-head shaped, white polyethylene top by Gibson Associates. Riged in front for easy grip, cap has cam-action for easy removal. On the label, by Nevins Company, the Prop logo is black on white, set off by opaque blue reverse printing and ochre side bars. Designer, George Stehl, Francis Blod Design Associates.

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TRENDS IN GLASS CONTAINERS

BY ENIO FELICIOTTI HAZEL - ATLAS GLASS DIVISION, CONTINENTAL CAN COMPANY

Glass is an ancient material. It has even been called the first synthetic material. Yet, the composition of commercial glasses today is not very different from that which the Egyptians produced in approximately 2,000 B. C.

You might take this to mean that the glass industry has lacked imagination, but, in reality, economics and the laws of physical chemistry are responsible for the limitation in variation of glass composition. The situation is such that we can not look for any trend toward change in the basic composition of glass used for containers.

Other aspects of the glass industry are by no means as nonchanging as is this factor. The manufacturing, design, and use characteristics of glass packages have undergone, and will continue to undergo, interesting changes.

In the realm of manufacturing advances, the important considerations at the present time are faster production speeds, lightweighting, increased strength, and bottle coatings.

Faster Production Speeds

Wih the production speed of modern glass-forming machinery, we can now make bottles at a rate of some 250 per minute as compared with the maximum rate of 30 to 40 a minute 20 years ago. Some glass manufacturers have set a goal of doubling the present production speeds during the next decade and have an eventual goal of making 700 or more units per minute.

Lightweighting

The industry is working steadily and with considerable progress toward achieving greater strength with less weight. The typical pre-war quart bottle weighed some 22 to 24 ounces; the same bottle today weighs 15 to 17 ounces. Quart jars that weighed 18 to 20 ounces 25 years ago today weigh 11 to 13 ounces. In general, the glass container of 25 years ago weighed one-and-a-half times as much as the same unit today. Recent studies and developments point to further lightweighting of wide-mouth jars by 20 per cent.

Economics of production and distribution is the strong incentive for weight reduction. Light-weight bottles permit faster forming machine operations which, in turn, lower container costs. Simplicity of design has aided in weight reduction, since forming of such containers is considerably easier.

COURTESY GLASS CONTAINER MANUFACTURERS INSTITUTE

Increased Strength

The glass manufacturer is extremely conscious of the fact that we are only utilizing about 1 per cent of the measurable laboratory strength of glass. Ordinary glass fibers show tensile strength of one million pounds per square inch, much stronger than the strongest steels. Unfortunately, glass is susceptible to stress concentrations, or, in the terms of the engineer, "notch sensitivity." Glass is weakened by pits, scratches, chips, and abrasions, which act as the site for concentration of the stresses that tend to cause breakage.

The industry goal is to raise the utilization of the inherent strength of glass from the present 1 per cent to 10 per cent.

Among the various means of achieving this goal are: (1) fire polishing to heal flaws; (2) treatment with hydrofluoric acid polishing solution to round off the defects; and (3) the application of coatings to the glass surface to minimize damage. The first two procedures are too costly and complicated to be considered commercially feasible at this time. Hence, major interest has been, and will continue to be, directed to bottle coatings.

Bottle Coatings

Among the materials used as coatings are sulfur, metallic oxides, waxes, resins, silicones and plastics. Unfortunately, no universally suitable coating has as yet been developed, since each in current use fails

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to fulfill one or more of the basic features required. Sulfur, for example, produces an objectionable white or grayish bloom on the glass. Metallic oxides are somewhat difficult to apply and leave an undesirable sheen. Waxes are water-soluble, hence not permanent, while silicones present labeling difficulties and problems in proper application.

Although resins and plastics have a tendency to reduce transparency and have somewhat limited water resistance, the future developments in bottle coatings will most probably be in the use of these materials. You are probably aware of the heavy plastic coatings now applied to glass aerosols. These are entirely suitable for that purpose, but cost factors do not allow their consideration as protective materials for other than the more expensive containers.

Another aspect of bottle coating currently receiving considerable attention is the development of procedures for application of ultra-violet absorbing compounds to the glass surface so as to screen out the sun's actinic, or chemically active rays. The short-wave lengths of the visible spectrum and the near ultra-violet are considered to be the source of the chemically active radiation responsible for color, odor, and flavor changes, as well as loss of potency of drugs.

Of the commercially available glass colors on the market today, only amber and a special formula green offer the protection required for light-sensitive products. The lack of aesthetic appeal of amber, and the somewhat limited availability of the special green do not allow their use for many products.

Future developments in application of the ultra-violet absorbing materials would greatly aid packers of light-sensitive products. Among the problems to be solved before such coatings are commercially available are cost of application, curing procedures, and reduction in the color imparted to the containers, but these are not considered to be insurmountable barriers.

Few product packers are presently purchasing coated containers, even though such materials are invariably applied by the glass manufacturer without any increase in cost. Whether the general failure of packers to avail themselves of this insurance stems from lack of awareness of their existence or is a result of inadequate understanding of their function, it can be categorically stated that a proper bottle coating can never do any harm and will in most cases do considerable good.

For those packers who use glass containers of heavy weight and large size, if we remember basic physics, we find that the kinetic energy of a moving object is calculated from the formula $KE = \frac{1}{2} MV^2$. That is, the energy of a traveling body is equal to $\frac{1}{2}$ of the mass times the square of the velocity. Consequently, mass is an extremely important factor in the effect on the glass surface when two containers collide. Through application of a protective coating, the glass surface is lubricated. As a result, the normal direct impact has a tendency to become a glancing blow of decreasing severity.

Keep in mind the fundamental fact that glass is only as strong as its surface and any defect that breaks through the surface materially reduces the performance of a container. The glassman's by-word is "save the surface and you save all." The damage that is done to an empty container is often that which causes failure of the filled item. Realizing that the failure of one of your filled containers involves considerably more financial loss than is the case with a smaller sized package, a factor as important as bottle coatings should not be overlooked.

Line Speed and Container Performance

While on this subject, let us give brief mention to the effect of line speed on container performance. It is a natural economic tendency to attempt to fill as many packages as possible within a given time period. Looking again at the formula $KE = \frac{1}{2} MV^2$, we call particular attention to the V factor, since each time we double the velocity the energy factor is increased by a factor of four. The relationship is not linear and even a slight increase in speed has substantial effect on the performance of glass. The one recommendation we could make here is to advise you to consult with your supplier before making any changes in your line operation. In many cases, this affords the manufacturer an opportunity to change or correct a functional design feature to improve performance.

Thermal Shock

Let us now consider the importance of thermal shock. Glass is designed to withstand a thermal differential of approximately 70° F. Any attempt to fill beyond this limit sets up sufficient stresses to cause failure.

Since many products are filled hot, it is essential that this be considered, especially when containers have been exposed to cold temperature during transit or storage. Preheaters, either through use of warm water sprays, steam injection, or radiant heat, have proved to be very helpful in reducing the incidence of thermal shock breakage with hot fill products.

In the course of our laboratory examination of containers, we routinely subject products to a series of tests to gain information on product fill, container capacity and any other feature deemed important for the product under study. In many cases we find conditions such as: (1) the use of containers with a great deal larger capacity than is required; (2) extremely excessive product weight or volume; and (3) inadequate control of product specific gravity.

Container Capacity

Let us look at these a bit more closely. Probably

(Continued on page 850)

Packaging and Selling

Only rarely do we see as frank and clear and honest a statement on what advertising is supposed to do as the following copy in an agency advertisement. This is the copy that won the annual reward from the American Association of Advertising Agencies. Winner was Pat Steel of Young & Rubicam, Inc.

"There is no chestnut more overworked than the critical whinny: 'Advertising sells people things they don't need.'

"We, as one agency, plead guilty. Advertising does sell people things they don't need. Things like television sets, automobiles, catsup, mattresses, cosmetics, ranges, refrigerators, and so on and on.

"People don't really need these things. People don't really need art, music, literature, newspapers, historians, wheels, calendars, philosophy, or, for that matter, critics of advertising, either.

"All people really need is a cave, a piece of meat, and possibly a fire.

"The complex thing we call civilization is made up of luxuries. An eminent philosopher of our time has written that great art is superior to lesser art in the degree that it is 'life-enhancing.' Perhaps something of the same thing can be claimed for the products that are sold through advertising.

"They enhance life, to whatever degree they can.

"Indeed that is the purpose of our unique and restless economy. It is fundamentally devoted to the production and distribution of things people don't need. Among them are toothpaste, electricity, outboard motors, artificial satellites, and education.

"Without advertising that economy cannot exist."

Something may be happening in men's toiletries. This dynamically growing industry is now a big market and is still expanding. In spite of that dynamism and all its promises, curiously enough, the prominent names—four that really made this field—have walked out of the franchise distribution setup which made them famous and prosperous, and are now pretty much tottering into the kind of disintegration that marked the passing of Courtley.

Consequently, this enormous market is now made up of several healthy and prosperous, mass distributed lines primarily based on the drugstore and the drug chain. Only a minor part of their business is in the department store, along with a large collection of small-volume sidelines from prominent cosmetic manufacturers, none of whom have an integrated, separate personality or identity. Which is significant.

There has been a virtual vacuum for prominent names and specialized treatment items in what is called the prestige or franchise, or basically in the department store market.

Since men's toiletries with department store distribution certainly do a business running up to $20 million a year, it is remarkable how the leading names have run out on this class of distribution, and that no new ones have been willing to invest enough time and money and creative thought to create another line for department stores that would have the stature once held by Seaforth, Sportsmen, King's Men and, when it was a coastal enterprise, Courtley.

Shulton's entry with its new prestige franchise line of men's toiletries into the department store may mean a change in this branch of the cosmetic industry, and a recognition that such a vacuum really does exist. Although it may be rumor, we understand that two other large cosmetic companies, both of which, like Shulton, have a mass distributed men's line, are also planning a prestige franchise distributed line for men.

Because everybody in the men's field has been running so heavily into mass distribution, we have had a feeling that a good many million dollars in gifts have been lost to the cosmetic industry—specifically, to the men's field. This does not mean that there is not some gift buying still in this field. However, it can hardly be denied that the department store will generate a vastly greater amount of gift buying of prestige products than drugstores can ever attain with products already established as a utility.

Here is what one newspaper commentator thinks about collapsible tubes.

"There are times when we suspect that companies are all using the same motivation studies on packaging. All the tubes in our medicine cabinet are either red-and-white or blue-and-white, and when they're rolled half-way up mistakes will happen. The other morning we brushed our teeth with medicated first aid cream. Wonder how many times we've put shaving cream on our children's bruises?"

Packaging sure is a growing industry. Look at the record.

The Glass Container Manufacturer's Association keeps reporting bigger and bigger sales for glass containers, at the same time that the plastic bottle people are issuing figures showing a substantial sales increase, and an increase in the number of manufacturers entering the plastic bottle field.

The aluminum can is getting a foothold in several industries and manufacturers are optimistic about a future tremendous growth, but, at the same time, the

tin can people seem to be doing very well.

All kinds of plastic films are on the market in a vicious competitive struggle that is booming sales, and yet, we read that cellophane has just had its best year.

The collapsible tube makers, through their association, have just reported all-time high sales. Apparently the invasion of their traditional field by squeeze bottles, aerosol packages, and plastic tubes has not bothered them a bit.

These are the healthiest signs of substantial growth that an industry could possibly have.

Twice as many women prefer to use a lotion than a cream in caring for their hands. Almost nine out of ten homemakers (87.6 per cent) actually use lotion, while the users of cream tote are slightly more than seven out of ten (7.9 per cent). In this duplication, 55 per cent use both a lotion and a hand cream.

Quite a high percentage of the women, that is, more than 50 per cent, use a lotion or cream on their arms, and 49 per cent on their legs.

More than a normal amount is used in winter, a seasonal variation with which this trade is well familiar.

All this from a survey by Homemakers Guild of America for the toiletry and cosmetic division of Owens-Illinois Glass Co.

A lot of things are happening to this industry which give it a good reason to be sensitive.

To pick just one, take the flood of adverse criticism of advertising. There isn't any question about a public reaction against misleading advertising, or flamboyant advertising, or advertising in bad taste with ill-supported claims.

Worse still, for the future, the eggheads are beginning to turn their highly critical attention toward advertising from an economic and social viewpoint, as well as the elmentary question of honesty and decency.

What makes it hard to take is that in almost every article and discussion critical of advertising, this industry seems to furnish a majority of the horrible examples. Both proprietaries and cosmetics, particularly on television, have contributed some of the smelliest misstatements and misrepresentations in advertising history. We only hope that the day is not at hand when some of these claims, reflecting so specifically on our industry, are given national publicity as evidence for corrective measures.

Polypropylene seems to be the big thing for the future in packaging. This is a product that is so light and absorbs so litle water that ropes made of it are strong enough to use on a tug boat, and yet float on the water.

It is tough and strong enough for machinery parts; it is resilient enough so that combs and brushes made from it can be bent double without breaking; it is also abrasion-resistant, and resistant to heat and to chemicals such as most acid and alkalis.

Anything can happen in the cosmetic business, but it is not very often that a big packing house company with side divisions in tanning extract, river transport, and so forth would diversify by going into the cosmetic business.

And yet, that is what has happened when International Products Corporation purchased Parfum L'Orle, Inc.

International today owns two million productive acres in Paraguay, with an unlimited supply of quebracho trees. Their herds of cattle now number 80,000. They have plans for expanding tanning extracts and for meat packing.

International Products is now in the process of diversification. Additional products such as soaps are planned for the future.

Apparently the slack-filled package is still a packaging problem.

Readers of this department many remember that a few months ago we told of how the FDA had returned to the slack-filled package after 20 years of silence, in a law suit aaginst a candy manufacturer, and had promptly been trounced again in a court decision.

One of the leading package designers has just made a somewhat limited consumer survey to study attitudes toward packaging. This survey showed, in its limited way, a rather conclusive degree of resentment among consumers toward some slack-filled packages.

For insance, slightly more than 25 per cent of those surveyed had some derogatory comment about the cookie and cracker cartons that were not filled to the top of the package.

Another group seemed to have built up a deep resentment against ketchup bottles and other narrow-necked bottles for viscous food products. Quite a number of these stated that such containers were due to a "premeditated waste" policy on the part of manufacturers to promote more frequent purchases.

Another group disliked the inverted bottom in bottles such as the champagne bottle, and a considerable number had a low opinion of manufacturers who packaged a jar or a tube in an oversize carton.

As we pointed out in discussing this previous court decision, the question of a slack-filled package is not as simple as it seems. For instance, some packages are oversize to prevent pilfering in a supermarket. Other requirements that influence packaging and may lead to a slack fill can be production difficulties in the factory, display requirements, and the like.

Probably there is no connection between the two, but a regular epidemic of medical journals seems to have broken out during the hearings in Washington on drug practices.

Among these new medical journals is the *Medical Tribune*, a newcomer that will have a newspaper format, which will be published as a Monday edition, later in the year adding a Thursday edition, and by some time next year it may become a daily.

Medical World, another newcomer, will have Dr. Morris Fishbein as editor. This is a fortnightly news magazine with controlled circulation.

New Medical Products, brought out last year by the publishers of the *American Druggist*, has a controlled circulation to all practicing physicians and is pretty much an all-advertising, monthly magazine.

The Journal of Nuclear Medicine, an official organ of the Society of Nuclear Medicine, began publishing at the first of this year.

Applied Therapeutics, a Toronto magazine, was launched at the beginning of the year.

The Doctor's Wife. This promises a controlled circulation reaching 180,000 wives whose husbands have an income said to average $25,000 a year, when it comes on the market.

According to an advertising agency man who has just made a survey, what the druggists want today in the way of advertising from manufacturers is television. They also like Sunday supplements, daytime radio, and trade advertising.

One thing druggists do not always think about concerning TV advertising is that it is a very expensive mass medium. For this reason anyone who is substantially successful in this great mass medium is inevitably moving into a broader field of mass distribution than drugstores alone.

Max Factor & Company plans to spend more than $100,000 in an advertising campaign to the "shorter-haired young male set" for its Crew Cut hair dressing.

We have been watching a flood of publicity on the teen-age market but 98 per cent of it has been devoted to the teen-age girl.

It seems to us that there should be an equally big market for many different things among the teen-age boys.

Although the total of spot television advertising has been increasing, the large participation of this trade in this advertising medium did not show an increase measuring up to the increases in several other classifications.

Nevertheless, Lanvin Parfums qualifies among the top users of spots with an expenditure of $379,400 in the last quarter of 1959.

Other advertisers using spots and increasing their expenditures in this final quarter are American Home Products Corp. from $2,011,100 to $3,207,800; Colgate-Palmolive Co. from $1,815,000 to $3,266,300; Max Factor & Co. from $473,800 to $908,000; Lanolin Plus, Inc. from $243,500 to $667,500; Plough, Inc. from $279,100 to $916,300; Procter & Gamble Co. from $9,273,500 to $12,035,400; Revlon, Inc. from $164,000 to $806,000.

The Raymond Loewy report on nonfoods based upon a $75,000 study for the Super Market Institute contains some interesting material for this industry.

For instance, an average supermarket grossing $2,000,000 annually needs a community of from 12,000 to 16,000 families to draw on. Out of this group, around 4,000 should be regular customers, not always necessarily the same ones but maintenance of a 4,000 level from the entire community.

These 4,000 families have an average of about $20,000,000 a year to spend, after taxes. Out of this amount they will spend about 8.2 per cent of their $20,000,000 on the kind of merchandise a supermarket might well carry—an additional 1.8 per cent on the kind of health and beauty aids which most supermarkets do carry.

According to this survey, supermarket operators should "go after cosmetic merchandise more positively and in greater depth." For instance, the items should be neatly classified, lipstick and nail polish should be in coordinated boxes to cut down on pilferage, and rouge, make-up, and powder should be added.

In a recent national survey, *Super Market Merchandising* has given additional data of interest to anyone selling supermarkets. This survey found that healthy and beauty aids account for the greatest percentage of total sales among all nonfood lines. In 1958, this accounted for $800,000,000, as compared to housewares, which produced $425,000,000, and toys, $100,000,000.

As an average for all stores, health and beauty aids produced 3.2 per cent of the gross sales.

Also in this survey, it was found that 86.6 per cent of the stores buy direct, 12.4 per cent from a rack jobber, 2.7 per cent from a food wholesaler, and 2.2 per cent from other wholesalers.

The typical supermarket today carries an average of 335 items in health and beauty.

It was found that women's and men's toiletries were in 100 per cent of the stores with a health and beauty department, lipsticks in 64.7 per cent, nail polish in 69.4 per cent, and higher priced cosmetics in 21.2 per cent.

A new policy that could be a trend was discussed recently by the advertising manager of Noxzema at a meeting of the Association of National Advertisers.

This company discovered that a product introduced in 1953, Noxzema Instant Lather, had built up a distribution which was far below the kind of national distribution needed to support national advertising.

At this time the company was spending all of its money in network TV on the Perry Como show. "Unfortunately, our distribution wasn't up to par in lots of the U. S.," declared this speaker, "and we

Whether you need a
SPRAY, STREAM or FOAM
Products under pressure
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Continental's new
PRESSURE TAB SIDE SEAM
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now permits higher pressure than any other 3-piece aerosol.

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That's not all—the new can provides greater protection over longer periods...holds higher pressures at elevated storage temperatures...increases the range of propellent mixtures useable in containers...paves the way for expansion in the entire aerosol industry.

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Pacific Division: Russ Building, San Francisco 4
Canadian Division: 790 Bay Street, Toronto 1
Cuban Office: Apartado 1709, Havana, Cuba

were virtually non-existent in the food stores, which traditionally do a huge shave cream business.

"Although Noxzema's share of market was less than 2 per cent, the company felt users of the product were exceptionally loyal to it. However, surveys were unable to specify any special type of consumer which would lead to specialized market advertising.

"The average factory sales per 1,000 population for Noxzema were $7.70 at that time—ranging from $2.12 in one territory to $23.52 in another. Yet we'd been treating all alike, by using a national TV show.

"The sales department had about reached a ceiling on distribution; from now on, we knew it would take increased consumer demand to crack the hard-to-sell accounts.

"Our first major decision was to abandon the idea of being a national advertiser . . . We figured we'd stand a lot better chance of getting fast increases in the $23.52 territories than we would in the $2.12 territories. So we laid out a bold plan: We'd concentrate on a few selected areas and spend right up with the leaders—away ahead of sales, if need be—while we'd put a small holding campaign throughout the rest of the country."

"This campaign has been effective since April, 1957. In the U. S., except New York and New England, we went from an index of 100 to 132 per cent in sales and 131 per cent in share of market. In New York and New England combined, our index went to 184 in sales and 176 in share."

Newspaper surveys, particularly those of the Scripps-Howard group, have shown that a high percentage of national advertisers do not have, in any sense of the word, a national distribution and do have a very scattered distribution showing apparent weak spots and vacancies. This has meant that in any advertising campagin for radio, TV, or magazines, a high percentage of the circulation and, therefore, the dollar expenditure, was being completely wasted unless it could be considered a missionary effort to force distribution.

The question then becomes: How many are going to spend money and let it go down the drain in a nondistribution area with a distant hope of forcing distribution?

This tan-without-sunshine part of the cosmetic business is growing by leaps and bounds. Ever since Man-Tan came on the market and showed the industry that there was a very nice volume of business in this entirely new cosmetic conception, we have had as newcomers Tan Tone, Positan, Tan-o-Rama, Magic Tan and One for a Man.

A rack jobber who operates in 500 supermarkets has just proved that health and beauty products with the same amount of retail space in a more favorable arrangement can easily increase sales as much as 30 per cent.

By using only the top four shelves of a gondola and spreading them over a complete gondola length, instead of all tiers of half a gondola, the sales of these health and beauty products took an immediate big jump.

Of course, this is pretty tough on the bottom shelves, which are now used for staples such as soap, detergents, paperware, and some cereals.

This is a pretty good indication of how supermarkets are more and more favoring the highly profitable products of the health and beauty department.

Here are some quotes from an article in the trade magazine, *Super Market Merchandising*, by F. Harry Fletcher, vice-president and sales director for Bristol-Myers.

"Yes, it is indeed an encouraging sign these days that more and more operators are waking up to what health and beauty aids mean to them. It is not surprising, however, when you realize that these items occupy so little of your time and space and even though they produce approximately two per cent of your volume, can give you 10 per cent of your net profit!

"To dramatize the picture, remind yourself that out of every dollar you ring up at the checkout counter in health and beauty aids sales, the manufacturer has spent about 35 cents in advertising and promotion. Add to that the 33 cents you have received in gross profit, and you realize how small a remainder is left to cover the production, distribution, and profit of the manufacturer.

"Reliable market research data show that you now sell seven out of 10 tubes of tooth paste sold in drug and food stores today—and in stores which, for the most part, carried no tooth paste 10 years ago!

"Yet the same people who buy this tooth paste purchase only 50 per cent of the hair preparations they buy, 49 per cent of their deodorants, 52 per cent of their headache remedy needs in food stores. The sales potential is obvious in these growing markets when you look at just one category alone, like deodorants, for example, which has grown from $55,900,000 in 1953 to $92,100,000 in 1958.

"In planning your strategy with health and beauty aids, you will want to play up your leading brands.

"For example, you'll discover that there are 83 price items among hand preparations distributed in food stores, and yet only 14 of these account for 76 per cent of the volume.

"Among hair preparations there are 124 price items, and yet only 13 of these account for 71 per cent of the volume; the remaining 111 accounting for only 29 per cent.

"Or take liquid shampoos. You'll find 123 price items in this category, and yet only 19 account for 69 per cent of this volume. The remaining 104 account for only 31 per cent."

your product belongs

in glass by Brockway

What makes a product belong? Acceptance by the consumer public . . . acceptance for the product itself . . . and acceptance for the container in which it is presented for sale. • A good product is greatly enhanced at the point of sale when presented in an attractive glass container . . . a glass container by Brockway. • Brockway provides individuality in a glass container . . . the kind of individuality that makes your product stand apart from all the rest, thereby providing a strong advantage at the point of sale. • A product that is worthy of consumer acceptance deserves a quality glass container by Brockway.

SYMBOL OF QUALITY · GLASS CONTAINERS ·

BROCKWAY GLASS

COMPANY, INC., Brockway, Pennsylvania

Sales Offices in Principal Cities

SUBSIDIARIES: Demuth Glass Works, Inc., Parkersburg, W. Va.

Tygart Valley Glass Co., Washington, Pa.

News in Packaging . . .

Glass Containers 1959

The Glass Container Manufacturers Institute, Inc., has issued its annual edition of its fact book, Glass Containers 1959. It includes Department of Commerce figures for 1959, as well as annual shipment figures by end-use categories for the 25-year period from 1935 through 1959.

The information on bottles for drugs and cosmetics shows that domestic shipments of these glass containers are 4.4 per cent more this year than in 1958. And over-all shipments were 7.1 per cent above the previous high in 1957.

Polyethylene Netting

The Film Department of the du Pont Company has introduced a new type of plastic packaging material, Vexar plastic netting, which provides advantages for wrapping a wide range of products. Manufactured by an exclusive process that extrudes polymers directly in net form in a single operation, the intersections of strands are an integral part of the material. The netting can be produced in an almost infinite variety of mesh sizes, filament diameters, strengths, stiffness, and colors. It is chemically inert, flexible, and resists moisture, rot, and mildew.

Among its many uses is that of an attractive cover around bottles and cans, which enhances their appearance and at the same time prevents sampling by shoppers, which is especially useful for aerosols and cosmetics sold through self-service outlets.

New Glass Container Coating

Ball Brothers Company, Inc., has introduced a new coating for glass containers called AP (abrasion protection). According to the manufacturer, the material provides a more durable protection than stearates, silicones, or emulsion coatings of high molecular-weight polymers. Labeling is said to be superior to that of uncoated bottles, and no special adhesives are required.

Jars coated with AP coating were subjected to retort temperatures of 240° F. for 40 minutes with no adverse affect on the protective qualities of the coating.

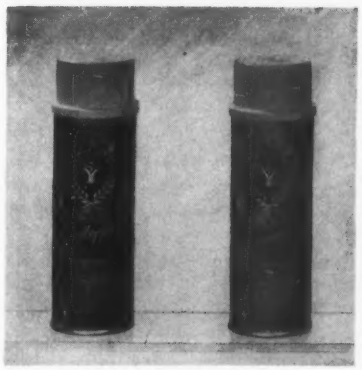
Burma Shave Signs Move Indoors

The red and white Burma Shave signs that have for years provided amusement along highways have now been incorporated into the new package design for Burma Shave in the form of a trademark—a miniature red and white highway sign, which appears on the packages themselves. The accompanying slogan is "Burma Shave—the sign of a good shave!"

Redesigning of the line was done by Thomas Laufer & Associates, Sausalito, California.

New Safety Vial

Celluplastic Corporation has introduced the Clearsite Saftey Vial, for dispensing dangerous medications. The clear plastic vials, in seven- or ten-dram capacities, are capped with a bright red closure with a built-in locking device.



New body dusting powder by Lenel, Inc., Dallas, in aerosol containers, being filled by Old Empire, Inc., Newark. There are three fragrances: Bellezza, Caressant, and Private Affair.

First item in Geigy Pharmaceuticals' new packaging line is Trofanil, a thymoleptic agent, in amber, wide-mouth bottles from Brockway Glass Co., caps from Ferdinand Gutmann, labels from Colorpress, and folding box from Wilkata.

Design Research

Lippincott and Margulies, Inc., has issued a 12-page publication on design as it affects marketing, merchandising, package and product planning, research, and store planning, called a progress report on design research

Aerosolizing of many water-based pharmaceuticals is possible by Armstrong Laboratories' new line for filling aerosols through a metered valve. Line comprises metering propellant pump, a gasser assembly, and assembly line. Statistical methods control accuracy.

Suture Package by Lukens Laboratories; outer tube, by Lusteroid Container Co., has cap that snaps off, allowing sterile inner, no-break glass tube by Kimble Class Co., to slide into sterile area; sterile nurse snaps off inner cap. Both closures are by the Carl Tabor Plastics Co.

A new, four-ounce, seamless aluminum pressure can developed by Continental Can Company. It combines lightness, strength, small diameter for easy handling, greater compatibility with some products than steel, excellent resistance to rusting. Inside can be plain or enameled.

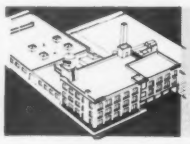
only
mother
nature
does
a better
packaging
job

Because we have always maintained the strictest standards of quality in the industry, G. Barr & Company customers have seen *hundreds of millions* of private label aerosol packages bearing their product names, reach the hands of consumers, perfectly formulated . . . perfectly packaged. Only Mother Nature does a better job!

Today—with more than 5 acres devoted exclusively to custom formulation and filling of aerosols, you can be certain that when G. Barr & Company manufactures your aerosol product, you will receive the finest, most versatile, most efficient and economical service available. If Mother Nature doesn't do YOUR packaging, call on us.

G. BARR & COMPANY

PRIVATE LABEL AEROSOLS



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NEWS and VIEWS

BY TED KLEIN PUBLIC RELATIONS DIRECTOR*

Medical Fees in France

Since 1789, there have been few countries with a heritage of freedom as rich as that of France. The average French citizen resents any governmental infringement on his rights with a fervor hard to describe. It was therefore considerably surprising to read in the May 15th issue of *The New York Times* that a ceiling had been imposed on medical fees by the government of General de Gaulle. "Despite widespread protests from physicians and dentists," the article ran, "the French Government set ceilings of medical and dental fees today as part of a social security reform.

"At the same time, with the approval of the labor unions and the public in general, a reimbursement to patients of 80 per cent of the imposed fees was decreed."

It is now law in France that a person visiting a physician's office will pay no more than 10 new francs (about $2.00), and that a house visit from a physician is only worth 13 new francs (about $2.60).

It is also reported that some physicians and dentists threaten a strike and will answer only the gravest emergency calls.

Bedside Companions

Recently I spent several weeks abed. Listening to the radio (a forgotten and most delightful companion) and reading was about all I could summon the energy to do. Two books I found especially interesting.

$5 Billion in Kickbacks, Payoffs, Bribes. This year an estimated $5 billion will be pirated from industry by white collar thieves. That's the contention of Norman Jaspan, a management consultant, and Hillel Black, free-lance writer, in a book from J. B. Lipincott and Company, *The Thief in the White Collar.*

The book details the case histories of many firms, large and small, that were bilked of millions by trusted employees. The behind-the-scenes facts about the swindles of Sergei Rubenstein, William Rose, The Bakery & Confectioners Union under the James Cross administration, and many others, are given in detail.

Here is a good book for managers, and I suppose it could serve as a primer for beginning embezzlers.

Sex and the Businessman. For good reason there is a great flurry these days on the part of management in trying to understand how the job affects the inner man. A new book, *Release from Sexual Tensions*, recently published by Random House, discusses among other items the sexual problems wrought by a man's occupation. The authors, Mary Calderone, M.D., Phylis and Robert Goldman, have this to say about a specific problem, "Sweating out a raise or a promotion, or a big contract can so preoccupy one partner that the other becomes less sexually active." The many interesting points adroitly discussed in this book make it valuable to any management executive who wants facts about a subject which has been much abused with misinformation and prudery for many years.

Organon's New Plant

On May 11th, Organon opened one of the most modern and most beautiful pharmaceutical plants I have seen. Along with this gala opening, the management of the West Orange, New Jersey, firm saw to it that residents of the town were told about the importance of the facility. Herewith is the text of the ad they took in the local newspaper, and also mounted (with a photo of the plant) for the benefit of visitors to the town's City Hall. We salute the informed public relations executive who created the message for the company's neighbors.

"Dear Neighbors:

"With a slight variation on the Latin, 'Ut sit mens sana in corpore sana', may I express our wish that a healthy industry may continue to grow in a healthy town. We want you to know that we are genuinely happy to be a part of this pleasant and progressive community. We can share with you the vitality that springs from ever-increasing growth, for our presence here reflects our own steady growth.

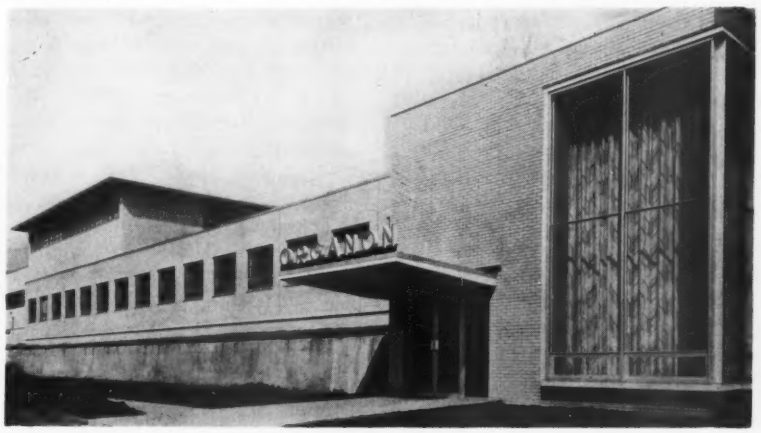
"We have exerted every effort to make Organon a welcome addition to West Orange by erecting a handsome building which will be surrounded by beautifully landscaped grounds in a park-like setting. This should certainly add to the beauty and dignity of West Orange.

"Since 1923, Organon has carried on intense research and has produced fine quality pharmaceuticals for physicians throughout the world. We have made many original contributions to world medicine, and these, in your physician's hands, have indeed helped to add more years to your life and more life to your years. In our new and modern administrative and research facilities here in West Orange, we will be better able to continue to serve the interests of medical progress and through this the health and well-being of mankind.

"We hope we will always be worthy of acceptance as a good friend and a good neighbor.

Sincerely,
Paul J. Van Helden, Jr.
President"

New pharmaceutical plant which was recently opened in West Orange, N. J., by Organon, Inc.



*Paul Klemtner & Company, Inc.

Patent thoughts and trends

BY THOMAS CIFELLI, JR., PATENT ATTORNEY*

Japanese Inventors

It has been said that, during the last century after Japan opened its doors to the world and began contacts with other peoples, one of the things which most impressed high Japanese governmental authorities when they visited this country was the U. S. patent system. This may or may not be factually correct, but it is believed to be common knowledge that the Japanese have a high reputation as being excellent copiers of other peoples' ideas. However, what is not so generally realized is that the Japanese have been making contributions of their own, increasigly of late. This is a definite impression gained by the writer in scanning the various patents issued weekly by the U. S. Patent Office.

An example of a recent patent showing that the Japanese do strike out on novel ground of their own is that afforded by U. S. 2,931,798 issued to Hamao Umezawa, Kenji Maeda, and Masahiro Ueda. The subject of the patent is the new antibiotic called kanamycin. A close look at this patent may prove to be of general interest.

The new antibiotic is said to be effective in inhibiting the growth of Gram-positive bacteria, Gram-negative bacteria, and mycobacteria.

The organism producing the antibiotic was isolated from a sample of soil collected in Nagano Prefecture, Japan, and is a new species, designated *Streptomyces kanamyceticus*, of the genus *Streptomyces*. A culture of the living organism isolated from the soil and given the laboratory designation K2-J has been deposited in the American Type Culture Collection, Washington, D. C., and added to its permanent collection of microorganisms as A.T.C.C. 12853.

Production of Kanamycin by Fermentation

"*Streptomyces kanamyceticus* (K2-J) was first cultured in shake flasks in the following media: (a) 0.75 per cent meat extract, 0.75 per cent peptone, 0.3 per cent NaCl, with 1.0 per cent of starch, dextrin, maltose, glucose, lactose, sucrose or glycerol; or (b) 2.0 per cent soybean meal, 0.05 per cent KCl, 0.05 per cent $MgSO_4.7H_2O$, 0.5 per cent NaCl, 0.2 per cent $NaNO_3$, with 1.0 per cent of starch, dextrin, maltose, glucose, lactose, sucrose or glycerol. The initial *p*H of all media was adjusted to 7.0. After 24-48 hours shaking in some cases the *p*H decreased to about 6.0-6.8, but from 72-120 hours the *p*H rose and became 7.5-8.6. The production of kanamycin was apparent after 48 hours and, depending on the media, the maximum production was found after 72-120 hours. The yield was highest with starch or dextrin, intermediate and about the same with sucrose, glucose, maltose and lactose and poorest with glycerol. Kanamycin was produced by media containing soybean meal, peanut meal, cotton seed meal, corn steep liquor, peptone, yeast extract or meat extract, with or without sodium nitrate. Commercially available soybean meal was recognized to be one of the best nitrogen sources. The addition of corn steep liquor, peptone, yeast extract or nitrate to the soybean meal promoted the production of kanamycin.

"In the above medium (b) containing 2.0 per cent starch, after three days of culture in shake flasks the *p*H rose to 8.2 and 250 mcg./ml. of kanamycin was produced. In tank culture with the medium containing 2.0 per cent starch, 0.5 per cent glucose, 1.2 per cent soybean meal, 0.05 per cent KCl, 0.05 per cent $MgSO_4$, 0.1 per cent K_2HPO_4, 0.3 per cent NaCl, 0.3 per cent peptone and 0.3 per cent $CaCO_3$, the *p*H at the beginning was slightly lowered (6.6) and then increased to 8.0 after 43 hours; 273 mcg./ml. of kanamycin was produced after 78 hours."

Nature of Kanamycin

"Kanamycin is obtained as its hydrochloride which is white, hygroscopic and amorphous. Its sulfate is obtained as a white amorphous powder or in crystalline form. The free base of kanamycin is obtained from these salts, for instance, by removing the sulfate ion by barium hydroxide from kanamycin sulfate solution.

"Kanamycin hydrochloride is freely soluble in water, soluble in methanol, slightly soluble in ethanol, insoluble in acetone, ethyl acetate, butyl acetate, benezene, ether or petroleum ether.

"Kanamycin sulfate is freely soluble in water, insoluble in methanol, ethanol, acetone, ethyl acetate, and benzene.

"The solubility in aqueous methanol was roughly estimated in the following manner: To an aqueous solution containing 90 mg./ml. of amorphous kanamycin sulfate 0.3, 0.4, 0.5, 0.7 or 1.0 ml. of methanol was added and, after the precipitate was removed by centrifugation at room temperature, the activity of the supernatant was determined. The results were as follows:

Amount of methanol added	0.3	0.4	0.5	0.7	1.0
Per cent of methanol	23	28.6	33.3	41	50
Kanamycin in the supernatant, mg./ml.	11.75	7.36	4.18	1.38	0.69

"Kanamycin sulfate can be obtained in colorless plate crystals. It becomes yellowish at 253° C., shrinks at 268° C., and becomes black at 276° C. An aqueous solution of 10 mg./ml. of crystalline kanamycin sulfate has *p*H 7.75.

"Kanamycin in aqueous solution is adsorbed by cation exchange resins, e.g. IRC-50, at *p*H 6-9.0 and eluted with 1 N HCl.

"A methanol solution of kanamycin does not show any ultraviolet absorption maxima in the range of 220-400 mμ.

"When paper strip chromatography was carried out (with Toyo filter paper No. 50 and 0.2 per cent p-toluenesulfonic acid-butanol saturated with water) the R*f* value of kanamycin was 0.21-0.26.

"Kanamycin exhibits optical activity. When a 1.0 per cent aqueous solution of purified kanamycin hy-

*Richards and Cifelli, Newark 2, New Jersey

drochloride was tested, $[\alpha]_D^{17}$ was $+103°$ and when a 1.0 per cent aqueous solution of kanamycin free base was tested, $[\alpha]_D^{17}$ was $+112°$, and when a 1.0 per cent aqueous solution of crystalline kanamycin sulfate was tested, $[\alpha]_D^{23} = +121°$.

"Kanamycin is more stable at neutral than acid *p*H. All of the activity was retained after heating at 60° C. for 30 minutes at *p*H 6-8. The activity was reduced to 60 per cent after heating at 60° C. for 30 minutes at *p*H 2.0.

When kanamycin was heated in 40 per cent sulfuric acid in a boiling water bath for one hour, the reaction product gave an ultraviolet absorption maximum at 280 mμ as does furfuraldehyde.

"Kanamycin, when tested by the agar dilution method, showed the following antibacterial spectrum:

Microorganisms:	Minimum concentration for complete inhibition in mcg./ml.
S. lutea PCI-1001	1.8
M. pyogenes var. *aureus* 209-P	2.2
M. pyogenes var. *aureus* Terajima	0.4
Micrococcus flavus	9.0
B. subtilis PCI-219	4.5
B. subtilis NRRL-558	4.5
B. subtilis Tracy	9.0
E. coli	2.2
S. paratyphi A	3.1
S. dysenteriae	1.6
Proteus vulgaris	6.2
Mycobacterium 607	3.1
Mycobacterium phlei	2.2
Saccharomyces sake	>300
Saccharomyces cerevisiae	>300
Candida albicans	>300
Aspergillus niger	>300

In Kirchner's medium it inhibited *Mycobacterium tuberculosis* H_2 strain at 2 mcg./ml. Streptomycin-resistant *E. coli* and streptomycin-fast *Mycobacterium tuberculosis hominis* was sensitive to kanamycin."

Regarding the uses of kanamycin, it is said to be useful as a general disinfectant, for example, for glassware in the form of a 5 per cent aqueous solution. Kanamycin is also said to be useful for the treatment of mastitis in cattle or calf scours, and for the preservation of fresh water fish and salt water fish. Also, kanamycin is said to be useful in the cure of bacterial infections in humans, for example, pneumonia and tuberculosis.

Kanamycin may be used along with other medicaments such as antihistamines, sulfa drugs, liptropic agents, stimulants of the central nervous system, local anesthetics, anelgesics, laxatives, and penicillin salts. A comparison of the activity of different species of kanamycin with streptomycin is given in the following table:

Activity Versus *Mycobacterium tuberculosis*

Organism	Minimum Inhibitory Concentration (mcg./ml.) Kanamycin A	Kanamycin B	Streptomycin
M. tuberculosis (H37Rv)	0.4-0.8	2.0-6.0	0.2-0.6
M. tuberculosis ($H37Rv_r$)	0.2-0.8	1.4-6.0	>2,000

Substitution of Drugs

The substitution of a drug not prescribed by the physician for the one specified by the physician is a well-known phenomenon. It has many facets which are not considered here. However, one of current interest is that a federal court has recently given a sweeping victory to a manufacturer of drugs prescribed but not furnished by the druggist. The decision in question also contains some information pertinent to the present controversy concerning drug pricing. For these reasons the case is abstracted below, in some detail.

The case involved an action by Smith, Kline & French Laboratories against William Broder doing business as Crown Drug Company, for trademark infringement and unfair competition. The Federal Court which decided the case is in Houston, Texas.

The court noted that SK&F does business to the tune of more than 100 million dollars a year, spending more than 12 million dollars annually for drug research and development, and more than 15 million dollars yearly for advertising and sales promotion. Judge Connally also noted that substantially all of the drugs sold by SK&F resulted from SK&F's own research and development.

The trademarks belonging to SK&F that were involved in the case were the following: Dexedrine, Dexamyl, Eskabarb, Teldrin, Edrisal, Trophite, Troph-Iron, and Spansule.

A brief summary of the uses for the various products covered by the marks follows.

"Plaintiff uses the mark Dexedrine to designate its brand of dextro-emphetamine sulfate, a central nervous system stimulant utilized in the treatment of depressive states, narcolepsy, alcoholism and overweight. Plaintiff uses the mark Dexamyl to designate its brand of dextro-emphetemine sulfate with amobarbital which combines a sedative with a central nervous system stimulant and is effective in the treatment of relatively minor mental and emotional conditions. Plaintiff uses the mark Eskabarb to designate its brand of phenobarbital, a sedative widely used in the treatment of conditions such as epilepsy, hypertension, insomnia, and nervousness. Plaintiff uses the mark Teldrin to designate its brand of chlorprophenpyridamine maleate, an antihistamine used in the treatment of contact dermatitis, asthma, hay fever, drug and serum reactions and other medical conditions. Plaintiff uses the mark Edrisal to designate its brand of amphetamine sulfate, aspirin and phenacetin, and analgesic used for the relief of pain from various causes such as arthritis, rheumatism, phlebitis, dysmenorrhea and headache. Plaintiff uses the mark Trophite to designate its combination of vitamins B_{12} and B_1 in the form of a clear red liquid having a cherry odor, which is used as an appetite stimulant. Plaintiff uses the mark Troph-Iron to designate its combination of vitamins B_{12} and B_1 and iron, also in the form of a clear red liquid having a cherry odor which is used as an appetite stimulant and for promoting growth and correcting nutritional iron deficiency. All of these drugs are well known to physicians and pharmacists by their generic or chemical names, and are available from sources other than plaintiff. Plaintiff uses the mark Spansule to designate its form of sustained release capsule, a development of plaintiff's research, wherein the medication is released gradually and evenly over a period of many hours. Administration of drugs in this manner is beneficial in many cases.

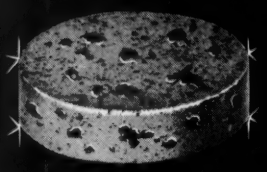
"Plaintiff's said products identified by the above-mentioned trademarks are well and favorably known to the medical profession, and to the wholesale and retail drug trade, and since their introduction plaintiff's sales of said products have exceeded $120,000,000.

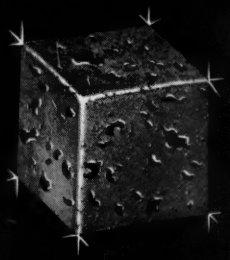
"Plaintiff's Dexedrine tablets are orange in color and triangular or "heart shaped." Plaintiff's Dexamyl

(*Continued on page 826*)

Reap Sales Gold with the New Richford Metallic Finishes!

"Gold Nugget"





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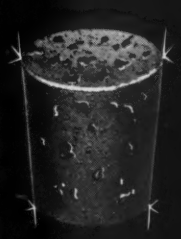

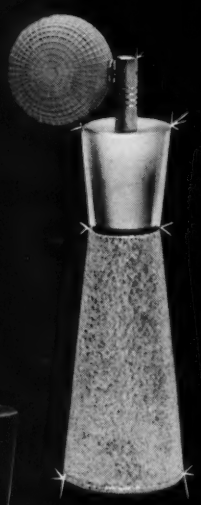

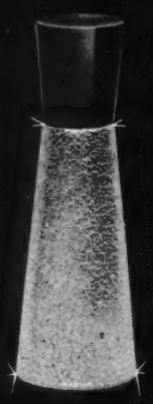

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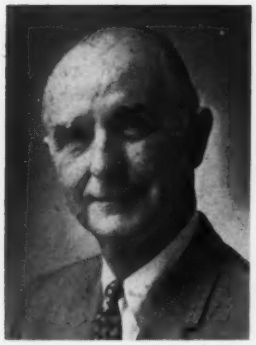


From left to right: Carl Stursberg, executive vice-president of the Warner-Lambert Products Division, Warner-Lambert Pharmaceutical Company; Dr. T. Bassiri, staff perfumer with Fleuroma, Inc.; Frank J. Woods, director for sales, Allied Chemical's General Chemical Division; and Richard C. Gilmore, Jr., Ph.D., M.D., who has been appointed director of clinical research, Pharmaceutical Laboratories Division of Schieffelin & Company.

NEWS...

Appointments and Promotions

Carl Stursberg, formerly with Street & Finney advertising agency, has been appointed executive vice-president of the Warner-Lambert Products Division, **Warner-Lambert Pharmaceutical Company.** The company has also announced the promotion of five executives to the newly created position of senior vice-president. Dr. Leonard A. Scheele, president of Warner-Chilcott Laboratories Division, a vice-president and member of the board of directors of the company, is now senior vice-president with responsibility for the ethical pharmaceutical marketing and corporate research activities. He is succeeded as president of Warner-Chilcott by Robert B. Clark, formerly executive vice-president. Philip A. Singleton, president of the Pro-phylac-tic Brush Company, is now also senior vice-president with responsibility for industrial products divisions, as well as responsible for Maryland Glass Corp. and Nepera Chemical Co., subsidiaries. Paul R. van der Stricht, president, Warner-Lambert International Division, is now also senior vice-president responsible for all international operations. Pierre A. de Tarnowsky, vice-president-consumer products divisions, is now senior vice-president-consumer products divisions, retaining his responsibilities for the manufacturing and marketing of consumer products, and for Canadian operations. John D. Miller, treasurer, becomes vice-president, treasurer, and chief financial officer; Frank Markoe, secretary, counsel, and member of the board, becomes vice-president, secretary and counsel. And William S. Lasdon, member of the board, has been named chairman of the executive committee.

Dr. T. Bassiri has recently arrived from France to take up his new work as a staff perfumer with **Fleuroma, Inc.** A veteran of 23 years in laboratory work in chemistry, biology, and perfumery, Dr. Bassiri holds a doctorate, an engineering degree, and two science degrees.

Allied Chemical's General Chemical Division has appointed Frank J. Woods director of sales. Mr. Woods has been with the division 22 years, as heavy chemical sales manager for the past ten. Thomas A. Wallace, Jr., a specialist in product development for General Chemical, has been made technical supervisor of Genetron sales for the division. Marvin S. Meirowitz, a Genetron salesman for five years, is now field sales manager for Genetron refrigerants and aerosol propellants.

Richard C. Gilmore, Jr., Ph.D., M.D., for the past several years engaged in private practice in Texas, has been appointed director of clinical research for the **Pharmaceutical Laboratories Division of Schieffelin & Company.** Dr. Gilmore has also taught in his field, and has done research as assistant department head of biocontrol, The Upjohn Company, and also in biochemistry, biophysics, organic synthesis, nutrition, and the medical application of radio isotopes, on which subjects he has published in scientific and clinical journals.

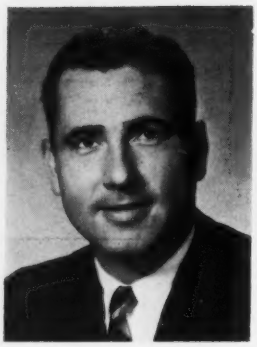
Strong Cobb Arner, Inc., has appointed Dr. L. Maxwell Lockie, a consultant and author of articles on arthritis, gout, therapeutics, and endocrinology, as a medical consultant in its research and development program. He will assist in evaluation, development, and testing of new drug compounds and product forms under study by SCA, and will also advise on product problems of customers.

Eric C. Zwerling has been elected vice-president for sales of **Dome Chemicals, Inc.** Mr. Zwerling was director of sales of Dome when the company was purchased by Miles Laboratories, Inc., in 1959, before which he was with Winthrop Laboratories.

I. Willard Crull has been elected to the board of directors of **Allied Laboratories, Inc.** Mr. Crull is president of Campana Corporation, a subsidiary of Allied, which is also the parent firm of Pitman-Moore Company. He joined Campana in 1928.

The **International Division of Chesebrough-Pond's Inc.,** has announced three executive changes: Lloyd V. Young, president of the division and senior vice-president of Chesebrough-Pond's, has retired as an officer of the company, to continue as a member of the board. William C. Watson, vice-president, treasurer, and a director of Chesebrough-Pond's, succeeds Mr. Young as president of the division, in addition to his other positions. And Ralph E. Ward, a vice-president of the International Division, has been named vice-president and general manager of that division, responsible to Mr. Watson for operations in all the company's overseas markets.

William J. Ashe has been promoted to administrative and financial vice-president of **Witco Chemical Company, Inc.** Mr. Ashe was formerly controller and assistant secretary.



From left to right: Karl T. Kraner, marketing manager for Kessler Chemical Co., Inc.; William E. Widerkehr, vice-president, sales for Crookes-Barnes Laboratories; William F. Laporte, executive vice-president, and Kenneth A. Bonham, vice-president, American Home Products Corp.

The **Kessler Chemical Company, Inc.,** has appointed Karl T. Kraner marketing manager. He has been with the sales and marketing departments of Atlas Powder Company for the past 12 years.

William E. Widerkehr has been made vice-president in charge of sales at **Crookes-Barnes Laboratories,** where he has served since 1957. He was previously sales manager for the ethical drug subsidiary of Chemway Corp.

The **American Home Products Corporation** has elected William F. Laporte executive vice-president and Kenneth A. Bonham vice-president. Mr. Laporte, with the firm for 22 years, became a vice-president in 1957, and a director later that year. He had been president of Whitehall Pharmacal Company (now known as Whitehall Laboratories), a subsidiary of American Home Products, since 1948. Mr. Bonham became Whitehall president in 1957, having served as executive vice-president and general manager for several months previously. For four years before that, he was assistant to the president of the parent company.

Richard N. Parks, vice-president-sales for **Shulton, Inc.** since 1958, has been elected to the board of directors. He joined Shulton in 1948 to take charge of market research and sales analysis.

New director of the commercial development department at the **J. T. Baker Chemical Company** is Frederic W. Hammesfahr, who has been, until recently, the vice-president of development at the Consolidation Coal Company.

Dr. Reginal L. Wakeman has been appointed vice-president and director of research and development by the **Onyx Chemical Corporation.** After various research positions, Dr. Wakeman joined the predecessor of Onyx as director of research, in 1945. Most recently he has been director of new research and development for the Packaging Corporation of America.

M. F. Antonovich, sales manager of the chemical department of the **Harchem Division, Wallace & Tiernan Incorporated** since 1958, has become general purchasing agent for the division. He joined Wallace & Tiernan in 1957, before which he had served with Advance Solvents & Chemical Inc. for 27 years, most recently as, concurrently, sales promotion and advertising manager, sales manager of the Vinyl Stabilizer Division, and vice-president and director of the firm's Canadian affiliate.

R. V. Vosburgh has been named a vice-president of **Loma Industries,** and head of the sales department of Loma's molded products division. For the past ten years, Mr. Vosburgh has been in charge of sales and advertising for Imco Container Corporation as executive vice-president.

Henry A. Strade has been appointed medical director of **Organon Inc.** Dr. Strade is assistant clinical professor of medicine at New York Medical College, associate attending physician at New York Metropolitan Hospital, an assistant attending physician at New York Metropolitan Hospital, and assistant attending physician at Flower Fifth Avenue Hospital, in New York City. Before joining Organon, Dr. Strade was associate medical director at Pfizer Laboratories, E. R. Squibb & Sons, and White Laboratories.

From left to right: Richard N. Parks, elected to the board of directors of Shulton, Inc.; Frederick W. Hammesfahr, director of the commercial development department of J. T. Baker Chemical Company; Dr. Reginald L. Wakeman, appointed vice-president and director of research and development, Onyx Chemical Corporation; and M. F. Antonovich, now general purchasing agent, Harchem Division of Wallace & Tiernan, Inc.

From left to right: Donald B. Huffman, field sales manager for the specialty sales department, a newly created position at Armour Pharmaceutical Company; Dr. Eugene R. Jolly, medical director for Ives-Cameron

Company; John M. Welch, sales representative for Dodge & Olcott; and Robert J. Roberts, promoted from his former position to district manager in the fatty acids sales department, Emery Industries, Incorporated.

Donald B. Huffman has been appointed to the newly created position of field sales manager for the specialty sales department of **Armour Pharmaceutical Company.** Mr. Huffman joined the firm in 1954, became a district sales manager in 1956 and division sales manager in 1958, in charge of the Portland and San Francisco areas. Dr. Marshall W. Bautz, with Armour since 1952, has been named manager of engineering. Most recently he has served as head of the pilot laboratory. In his new position he will be responsible for process, plant, and industrial enginneering at the Kankakee, Ill., plant.

Dr. Eugene R. Jolly, formerly medical director of Hoffmann-La Roche Laboratories, has joined the **Ives-Cameron Company** as medical director. Dr. Jolly is also a consultant in clinical pharmacology at Seton Hall University College of Medicine and Dentistry.

John M. Welch has been appointed sales representative in the **Dodge & Olcott** Los Angeles office.

Emery Industries has promoted Robert J. Roberts to district manager of the fatty acid sales department, where he has served since 1956. He joined Emery in 1939 as a control and development chemist.

Clarence W. Sondern, Ph.D., has established a chemical and pharmaceutical consulting service in Morristown, New Jersey. For the past ten years, Dr. Sondern has held administrative posts in research and quality control with the Warner-Chilcott Division of Warner Lambert Pharmaceutical Company.

Revlon, Inc., has promoted Alec Faberman to the newly created position of vice-president for administration. Mr. Faberman has been with the company for 13 years, most recently as a vice-president and controller.

Joseph Schwartz has been appointted director of purchasing for **Bourjois, Inc.** Mr. Schwartz was most recently in the same capacity at Helene Pessl, Inc., which was acquired by Bourjois in January of 1960.

Robert M. MacFarlane has joined **Lanolin Plus, Inc.,** as general sales manager. He had been assistant general sales manager for Warner-Lambert Pharmaceutical Company.

Edward H. Frink, formerly director of finance, has been appointed administrative vice-president of **Merck Sharp & Dohme International Division of Merck & Company, Inc.** He will direct the major staff areas of M.S.D. International. As of July first, John E. Fletcher, Chief of the Office of Research Information, National Institutes of Health, will become manager of public relations of **Merck Sharp & Dohme,** division Merck & Company. Mr. Fletcher joined the NIH in 1949 as consultant on the use of television and films in medical research. In 1959 he was Chief Press Officer for the U. S. Delegation to the World Health Organization in Geneva.

Robert M. Aude has been appointed president of the **Heyden Chemical Division of Heyden Newport Chemical Corporation.** He has been vice-president and general manager of the division since 1958. Mr. Aude joined the corporation in 1953 as a plant manager, and in 1956 was named director of sales planning and coordination. Newly elected vice-president and secretary of the corporation is James K. Lindsay, formerly secretary, and Bernard L. Reiter is now treasurer.

From left to right: Clarence W. Sondern, who has established his own chemical and pharmaceutical consulting service in Morristown, N. J.; Alec Faberman, promoted from vice-president and controller to the newly created position of vice-president for administration at Revlon, Inc.; Joseph Schwartz, director of purchasing for Bourjois, Inc.; and Robert M. MacFarlane, general sales manager for Lanolin Plus, Inc.

Once in a blue moon a really fragrant synthetic arrives—Lilial—Givaudan's contribution to floral naturalness! Lilial*—a pure aldehyde with an intense and diffusive note that recalls linden blossoms, with the emphasis on fragrance, represents a new high for synthetics in perfume elegance.

Lilial has remarkable tenacity and lends unmatched floralcy, intimate warmth and unique naturalness to almost any composition. On a perfume blotter it lingers for more than a month.

Unusually stable in soap, *Lilial* is long-lasting and diffusive. It is available in quantity—at a moderate price. No one synthetic has ever presented more desirable qualities to the perfumer.

Samples and technical data are available upon request.

*U.S. Pat. No. 2,875,131—Trademark Reg. U.S. Pat. Off.

GIVAUDAN-DELAWANNA, INC.

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New York 36, N. Y.

Matthew J. Middleton has been appointed vice-president of **Hazel Bishop, Inc.** Mr. Middleton was formerly a consultant, following three years as director of marketing for Helena Rubinstein, Inc. Kenneth M. Freedman, formerly general sales manager of the Lady Esther division, Chemway Corporation, has become sales manager.

Wayne Hicklin, vice-president in charge of sales of **Avon Products, Inc.,** has been elected to the board of directors. Mr. Hicklin began with Avon 31 years ago, becoming vice-president in charge of sales in 1947.

Mimi Weiss has been appointed sales promotion manager of **Alexandra de Markoff.** She had been fashion director of Princess Marcella Borghese.

Earl B. Winebrenner, formerly advertising and professional relations manager for Armour Pharmaceuticals, has been named advertising manager of **Smith-Dorsey, Division of The Wander Company.** Michael A. Luria, who has been associated with Strong Cobb, is now plant manager for the division. David H. Sanders, now marketing manager for Smith-Dorsey, joined the firm in 1959 as advertising director.

Dr. Lester D. Apperson has been appointed director of research for the **Toilet Articles Division, Colgate-Palmolive Company.** He had been manager of skin and oral products research. Robert A. Evans has joined the **Biological Research Laboratories** in pharmacology and toxicology. He had been with Armour Pharmaceutical Company.

Joseph R. Prill and Don H. Phillips of the sales division of **Pharmaco, Inc.,** have new positions, Mr. Prill as sales promotion manager, Mr. Phillips as field manager, along with his responsibility for sales.

Charles Spannello, manager of pharmaceutical production since 1956, has been appointed director of purchases for **Schering Corporation,** succeeding the late Ordine C. Ferris. Robert Crooker is now assistant sales training manager.

Puritan Aerosol Corporation, private label and custom loader of aerosols, has appointed Theodore A. Thonet associate research director. He formerly served as research director of Continental Filling Corporation.

Dr. Earl T. Lewis, a resident physician in internal medicine at the University of Mississippi Medical Center, has been named associate director of clinical research by **Mead Johnson & Company.** William H. Derbins has been promoted to director of the product management department in the nutritional and pharmaceutical division. He had been group director for formula products.

The **Allen B. Wrisley Company** has appointed Paul Skillman, Jr., merchandising manager with the Toni Company, as general sales manager.

Joseph E. Funnell, professional assistant, medical department of **Eaton Laboratories Division of Norwich Pharmacal Company,** has been appointed sales administrative assistant for the division, a new position.

Dr. Glenn Brewer, a senior research scientist, has been appointed supervisor of the analytical research laboratories, analytical and physical chemistry section, **The Squibb Institute for Medical Research.**

Zenith Laboratories, Inc., has appointed Harry B. Cady as production manager. He had been with Cosmos Chemical Corporation.

M. T. Bielser Visits Givaudan U.S.A.

M. T. Bielser, production manager of Cia. Brasileria Givaudan, Sao Paulo, Brazil, recently visited The Givaudan Corporation in the United States, to establish personal contact with plant management and

M. T. BIELSER

the research and development departments here. This is part of a program of coordination of the various members of the international Givaudan organization, to facilitate customer service abroad.

S. T. Olds Elected

Stanley T. Olds of Hoffmann-La Roche, Inc., has been elected president of the newly organized Midwest Industrial Chemical Salesmen's Association, with headquarters in Chicago.

STANLEY T. OLDS

Other officers are Edward Lasek, Tennessee Products & Chemical Corporation, vice-president; Raymond Champlin, Meer Corporation, treasurer; and Paul Brna, Rhodia, Inc., secretary.

J. A. Franklin Celebrates 50 Years With Whittaker

John A. Franklin, secretary-treasurer of Whittaker, Clark & Daniels,

JOHN A. FRANKLIN

Inc., is celebrating 50 years with the company, where he began as an office boy upon his arrival from England that many years ago.

Roche Coral Groups Perform

Members of the Roche Male Choristers and the Roche Girls' Chorus gave their second combined public performance on May 19 in the Nutley, N. J., High School Auditorium. All are employees of Hoffmann-La Roche Inc.

MEDICINAL, PHARMACEUTICAL AND VITAMIN FLAVORS

by Florasynth

We maintain a special laboratory for research and development of flavors for use by the pharmaceutical industry including the development of appropriate flavors suitable for specific individual preparations...

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	SUGGESTED USAGE TO 1 GALLON SYRUP
Caramellone Syntharome Imit. Butterscotch Flavor	¼ to ½ oz.
Concentrated Imitation Butterscotch Flavor	2 ozs.
Concentrated Imitation Caramel Flavor	1 oz.
Imitation Tame Cherry Flavor 2:1	2 ozs.
Syntharome Imit. Wild Cherry Flavor Special	¼ to ½ oz.
Imitation Wild Cherry Flavor 2:1	2 ozs.
Imitation Chocolate Aroma Flavor	2 ozs.
Cola Type Flavor 1:1	½ to 1 oz.
Cola Type Flavor 4:1	4 ozs.
Concentrated Lemon-Lime Flavor	¼ to ½ oz.
Licorice Type Flavor 1:1	½ to 1 oz.
Syntharome Imitation Maplenut Flavor	½ oz.
Syntharome Imitation Raspberry Flavor	¼ to ½ oz.
Syntharome Imit. Tutti-Frutti Flavor	¼ to ½ oz.
Imitation Tutti-Frutti Flavor 2:1	2 ozs.
Imitation Rum and Butter Flavor	½ oz.

The indicated usages to the gallon of syrup are mentioned purely as indications for test evaluation work in manufacturer's own formulations.

ENTRAPPED POWDERED FLAVORS

Florasynth being one of the first companies to manufacture powdered flavoring materials, we list below descriptive details of what we feel to be the finest type of New Entrapped Powdered Flavors. Features of these New Entrapped Powders are (1) as high as 50% oil content by weight. (2) Instantly dispersable. (3) Non-hygroscopic. (4) Extremely economical. Shelf life studies have indicated excellent results.

	SUGGESTED USAGE TO 100 LBS.
Apple Imitation	2 to 4 oz.
Banana Imitation	2 to 4 oz.
Cherry Imitation	2 to 4 oz.
Cola Type	2 to 4 oz.
Grape Imitation	2 to 4 oz.
Lemon	2 to 4 oz.
Lemon-Lime	2 to 4 oz.
Lime	2 to 4 oz.
Loganberry Imitation	2 to 4 oz.
Maple Imitation	2 to 4 oz.
Orange	2 to 4 oz.
Pineapple Imitation	2 to 4 oz.
Raspberry Imitation	2 to 4 oz.
Root Beer	2 to 4 oz.
Strawberry Imitation	2 to 4 oz.
Tutti-Frutti Imitation	2 to 4 oz.

Other Entrapped Flavors Developed on Request

Standard Packing: 150 lb. containers

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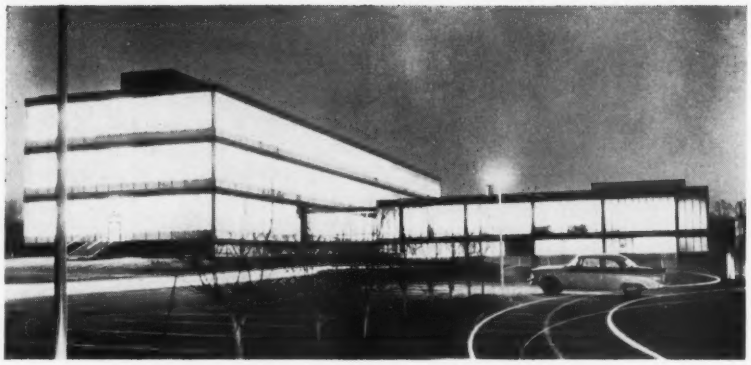


Union Carbide Chemicals Company's new Technical Service Laboratory near Tarrytown, N. Y., in Westchester County, which houses the customer service facilities. There are 46 individual laboratory units, offices, and supporting facilities, as well as a Mechanical Test Building.

Union Carbide Opens Technical Service Lab

Union Carbide Chemicals Company has formally opened its new Technical Service Laboratory in Tarrytown, N. Y., bringing under one roof customer service work previously carried on in six different locations. The multi-million dollar laboratory building will not only bring needed administrative unity but will also permit expansion of the technical staff. Most important, however, the new location permits more frequent and closer customer contact.

According to J. A. Field, Carbide's marketing vice-president, "technical service has become an indispensable part of product development and sales. It assists customers in the best use of products. It helps the manufacturer to be aware of changing markets that affect current and future sales. It encourages development of new uses for products to diversify and expand markets." It is no longer possible for a chemical marketer to take a new product to customers and expect them to to do the necessary development work. This customer-oriented laboratory works on customer ideas and problems and encourages use of facilities by customers.

Functions of the laboratory are summarized by its director, Dr. A. B. Steele. "(1) To assist customers in the proper use of company products, as a means of expanding the volume of sales in known applications; (2) to create an awareness of changing markets, which can affect current sales and be developed into opportunities for expanding sales; (3) to foster the development of new uses for products in order to diversify and expand existing markets; (4) to follow customer requirements for specific chemicals, in order to determine the need for, or the desirability of, improved specification standards; (5) to aid in the training and retraining of sales representatives, to improve sales techniques, and to impart basic knowledge and understanding of the technology of company products in industries that can and should be served."

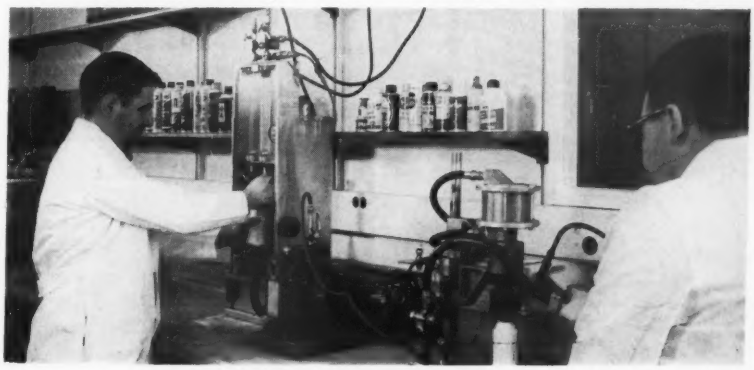
Organization of technical service is along 29 industry lines, which embrace the end uses for more than 400 synthetic organic chemicals made by Union Carbide Chemicals Company. Included in these groups are cosmetics and personal products, automotive products, petroleum, polyester foams, aerosol propellants, refrigerants, textiles, plasticizers, detergents and household products, gas purification, and surface coatings. The staff consists of about 100 scientists and 50 nontechnical people.

The Laboratory consists of the main laboratory building and the mechanical test building. The former is 300 feet long by 60 wide, three stories, of stainless steel and glass. About one-third of the available space is devoted to offices and public areas, including the library, conference rooms, and a lounge. The larger section of the main building is divided into 45 laboratories with 33 adjoining offices. Individual laboratories differ according to their function, but most are air-conditioned, with piped steam, air, vacuum, gas, conductivity water, and hot and cold water. An elevated causeway leads to the stainless steel and glass mechanical test building. Activities here, requiring more room and larger equipment, include large-scale foaming of polyethers, testing of oil additives and lubricants, pilot-size emulsion polymerization, processing of vinyl compounds. In a number of especially equipped rooms, tests are conducted on brake fluids, anti-freeze ingredients, gasoline additives, and aerosols, among others. A wide range of aerosol research is carried out, including studies on water-based systems and problems of emulsion and stability. Aerosol laboratory equipment includes cold and pressure filling units, as well as units for testing spray rate and spray pattern, and calibrating vapor pressure gauges. Related instruments in the technical center include a gas chromatograph, spectrographs, and a three-dimensional microscope for photographing spray patterns.

Couderchet in France

M. G. Couderchet, president of Charabot & Company, Inc., has left for Grasse, France, where he plans to spend a few weeks at Charabot & Cie., for which company the American firm serves as sole distributor in the United States and Canada, discussing expansion of business.

Union Carbide's Technical Service Laboratory. Here an aerosol test unit being loaded with propellant (left) and the valve crimped (right). The laboratory is equipped to test all phases of pressure packaging, to carry out development work for customers' products, and to screen new products.



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Dr. Cox Cited by National Pharmaceutical Society

Dr. Herald R. Cox, director of viral and rickettsial research at Lederle Laboratories and president-elect of the Society of American Bacteriologists, has received the Rho Chi Citation and delivered the Annual Julius W. Sturmer Memorial Lecture, sponsored by Alpha Tau Chapter, Rho Chi National Pharmaceutical Honorary Society, at the Philadelphia College of Pharmacy and Science. His address was titled "Immunization with Living Attenuated Viruses, with Special Reference to Poliomyelitis."

Schering President Honored

Francis C. Brown, president of Schering Corporation, has been awarded the Grand Cross of the Eloy Alfaro International Foundation at a ceremony in Washington, D. C.

General Jacob L. Devers, U.S.A. (Ret.) made the presentation, in recognition of Mr. Brown's services in improving the health of peoples throughout the world.

The Alfaro Foundation was instituted in the Republic of Panama to perpetuate the memory of General Eloy Alfaro, president of Ecuador at the turn of the century, and a leader in bringing democratic political and moral values to Latin America.

Enzyme Products Gets New Name

The board of director of Enzyme Products, Inc., ethical pharmaceutical manufacturer in California, has voted to change the corporate name to Blair/Johnson, Inc., according to Dwight O. Johnson, president of the firm. The change, effective now, was made in anticipation of future broadened activity for which the former name was thought restrictive.

Dais guests at Cosmetic Career Women's sixth annual men's day, left to right: The Honorable Lowell B. Mason, former member of Federal Trade Commission; Dorothy Fey, U. S. Trademark Assn.; H. W. Hamilton, Chemical Specialties Mfgs. Assn.; Helen L. Booth, DCAT; The Honorable Earl W. Kintner, Federal Trade Commission; Gina Kohnman, J. Walter Thompson Co.; S. L. Mayham, T.G.A.; Lee H. Bristol, Sr., Advertising Council, Inc. and the Bristol-Myers Company.

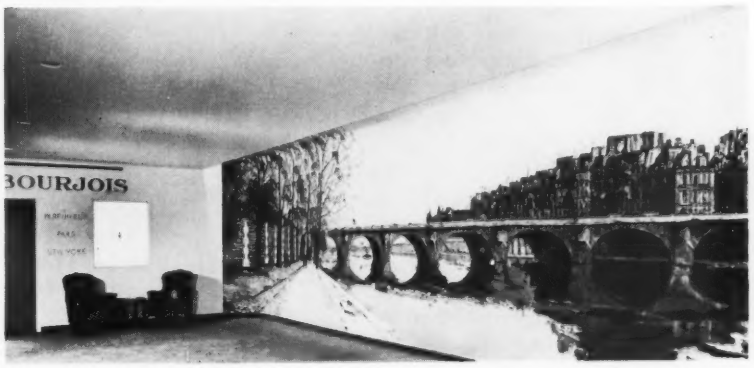
M. deNavarre Receives Award

Maison G. deNavarre, vice-president and director of Cosmetic Laboratories, Inc., Detroit, is one of four Wayne State University alumni who received Alumni Awards at the University's Reunion in May. Perhaps best known in his capacity as editorial director of *The American Perfumer and Aromatics*, Mr. deNavarre is also editor and publisher of *The Journal of The Society of Cosmetic Chemists*, as well as a director of Beauty Counselors, Inc., and an officer of Helfrich Laboratories of Toronto, Canada.

New Pharmacology Laboratory

The C. Mahlon Kline Pharmacology Laboratory at the Philadelphia College of Pharmacy and Science was recently dedicated at a convocation at which Dr. Chauncey D. Leake spoke. The Laboratory was named in honor of Dr. C. Mahlon Kline, Honorary Chairman of the Board of Smith Kline & French Laboratories and Vice-President of the College, who also spoke at the dedication.

Mural by French painter Bernard Lamotte for Bourjois, Inc., at the new offices, 711 Fifth Avenue.



Browne Elected President U. S. Trademark Association

Dudley Browne, vice-president of American Home Products Corporation, was elected president of The U. S. Trademark Association at its 83rd annual meeting in May. Among the other officers is Robert H. Hosik, head of the general law department of The Upjohn Company, elected a vice-president.

Merck Expands British Facilities

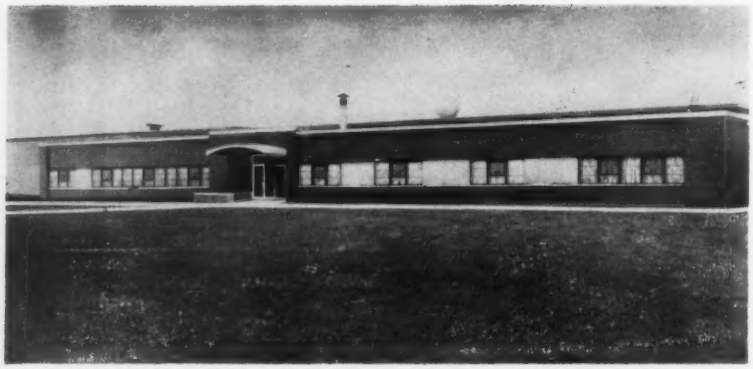
New pharmaceutical manufacturing and research facilities of Merck Sharp & Dohme Limited have been opened in Hoddesdon, England. They triple the space available for manufacturing, and provide a laboratory area for research. Dr. Vannevar Bush, chairman of the Merck board, spoke at the inauguration.

Nine Join Lehn & Fink Quarter Century Club

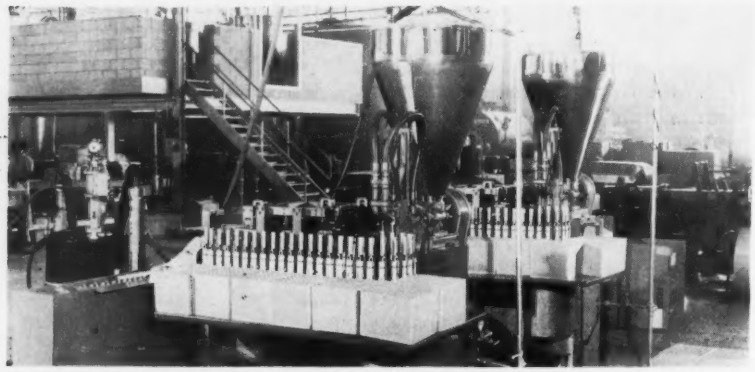
Nine new members of Lehn & Fink's Quarter Century Club, employees with 25 years of continuous service or more, and one member with 50 years, were recently honored at the club's eighth annual meeting at the Waldorf-Astoria Hotel, a dinner-dance.

The guest of honor was William Froelich, who celebrated his fiftieth year of service with the company. He is supervisor of Consumer Service in the Bloomfield, N. J., plant. Mr. Froelich was presented with a substantial cash gift and a six weeks' vacation.

The new members are Tom Gabrio, Irene Carey, Paul Jackson, Harold O'Neil, Logan Skogsberg, Frederic Solla, George Suydam, Jan Wolters, and Ted Zawish.



New concrete and steel building opened by the Alberto Culver Company at 2525 Armitage Road, Melrose Park, Ill., a suburb of Chicago. It houses offices, laboratory, manufacturing, and warehouse facilities for the company. The one-story structure cost more than one million dollars.



Close-up of Culver's tube filler by Arthur Colton Company installed in the company's new plant.

The automated filling line in the new Alberto Culver Company's plant, which packages a dandruff preparation. The unscrambler is by F. B. Redington Co., 16-head filler by MRM Co., Inc.; capper by Resina Automatic Machinery Co.; labeler by New Jersey Machine Corp.; cartoner by Redington. Bottles for the preparation are supplied by the Owens-Illinois Glass Company, Toledo.

Baxter Expands Pharmacology Laboratory

A $190,000 addition to the pharmacology laboratory of Baxter Laboratories, Inc., has been completed at Morton Grove, Illinois. The 5,000 square-foot structure is to be used for the development and testing of new drugs under Dr. Robert Gesler, director of pharmacology.

The air-conditioning system, which represents more than half the cost of the structure, provides a laboratory temperature that will not vary from 75° F. throughout the year, and a relative humidity of 50 per cent will be maintained throughout the building—both essential for drug evaluation.

New Mexican Citric Plant Opened

A new fermentation plant is being built in Cuernavaca by Quimica Mexama, S.A., a company formed by a group of Mexican investors in partnership with Miles Laboratories.

President of the Mexican company is Luis G. Aquilar of Mexico City. E. H. Beardsley, executive vice-president of Miles Laboratories, is a member of the board, as is also H. F. Roderick, president of Miles Chemical Company, a division of Miles Laboratories.

The $1.5 million chemical processing plant is about 50 miles south of Mexico City. Production is expected to be under way in September of this year.

The plant is being built so that its facilities can readily be doubled, on 12 acres of land. Its initial capacity is expected to be able to satisfy Mexican citric acid needs in the present. An all-Mexican operation, its use of the Miles process for citric is of significance for Mexico, since it utilizes cane sugar, a surplus commodity in Mexico.

Walter F. Silbersack

Walter F. Silbersack, president of American Home Products Corporation, died at his summer home in Darien, Conn., on June 7. He was 58 years old.

He had joined the A. S. Boyle Company in 1923. Four years later it was purchased by American Home Products. He became a director in 1935 and president in 1945.

Robert L. McKnight

Robert Lewis McKnight, who retired ten years ago from his position with the sales division of the Scovill Manufacturing Company after 25 years there, died on May 26 in Watertown, Conn., where he had been visiting his daughter. He was 80 years old.

Carl F. Eveleigh

Carl F. Eveleigh, who retired in 1955 as executive vice-president of Eli Lilly and Company, died May 21. He was 70.

Mr. Eveleigh had been associated with Lilly for 42 years, starting as a cost accounting clerk in 1912.

John T. Gillespie, Sr.

John T. Gillespie, Sr., chairman of the board of directors of Gillespie-Rogers-Pyatt Company, Inc., died on May 21.

Mr. Gillespie had been active since 1894 in the firm which his grandfather founded in 1824, and was president for many years. His son, John T. Gillespie, Jr., is now president.

Management Forum

BY FRANCIS CHILSON
INDUSTRIAL CONSULTANT

The Challenging Sixties

Let me state in question form some of the problems and conditions drug industry administrators will be confronted with during the sixties.

Are we headed for some form of socialized medicine? My answer is Yes, and the Forand bill certainly looks like it. Politicians in the past have bought the votes of veterans with largesse of one kind or another. Now they're going to buy the votes of old people. Next it will be medical care for veterans families; then, medical care for all school children—and so it goes. I'm not too much concerned about socialized medicine as such. Actually it is working well in England and has thus far benefited the pharmaceutical industry. I am concerned, because every social welfare measure passed by our legislators accelerates the drift to the left.

Are we headed for a planned economy? Keeping ahead of the Russians in the economic sphere is of basic importance to our continuance as a free nation because, if we can't do that, no amount of military preparedness will be of any use to us. There are a lot of well meaning dunderheads in Washington who are advocating a planned economy as the only means of beating Russia. Let's face it. The maintenance of a big military establishment forces a certain amount of planning on the economy, and it is my hope that the movement can be contained there. But, if it isn't, how will the drug industry fare when operating under allocations made in Washington and sales made with predetermined, controlled prices?

How can we cut the costs of distribution, detailing, and advertising? We have done a pretty good job of cutting production costs within our factories, but our total production costs are only a small fraction of what it costs the industry to market and distribute our products. In this area we engineers have done no work at all. There are a lot of obvious ways to cut distribution costs if we could convince our top managements to go along, such as jointly owned warehouses, mutual contract manufacture, and the like.

How can cost of research be cut? Research is rapidly becoming a marketing tool. In an age of rapid product obsolescence, the marketing man who gets there "fustest with the mostest" will get the lion's share of the business. Since the trade has gone in for research, we have built too many glass palaces. Better engineering should be applied to lab design, which should be based on compactness, convenience, and expandibility. Chemists need plenty of convenient table, cabinet, and drawer space and lots of services and equipment. They don't need Taj Mahals. Research costs have increased from $90 million in 1954, to $190 million in 1959, and in 1960 it will go over $200 million.

It is not so long ago that the total net sales of the ethical branch of the drug industry did not amount to this much money. It would be foolhardy indeed to say that all this money is being wisely spent. Here again, a broader management outlook would make possible great economies through cooperative research.

How can management assure itself of an adequate supply of first-class brains? Obviously one of management's most important responsibilities is to perpetuate the business under its control by providing first-class, trained brains throughout its organization.

Obviously management can no longer raid Government departments, the universities, and competitors for outstanding men. The industry is growing so rapidly that there aren't enough to go around. A few companies are supporting scholarships and a few more are contributing to universities and educational funds. But the amount thus far spent is pitifully small. Management must select and educate its own talent if it is to ward off a crisis a few years hence. Several years ago I tried to get the industry to support pharmaceutical engineering courses in several universities, but nobody was interested; nobody con-

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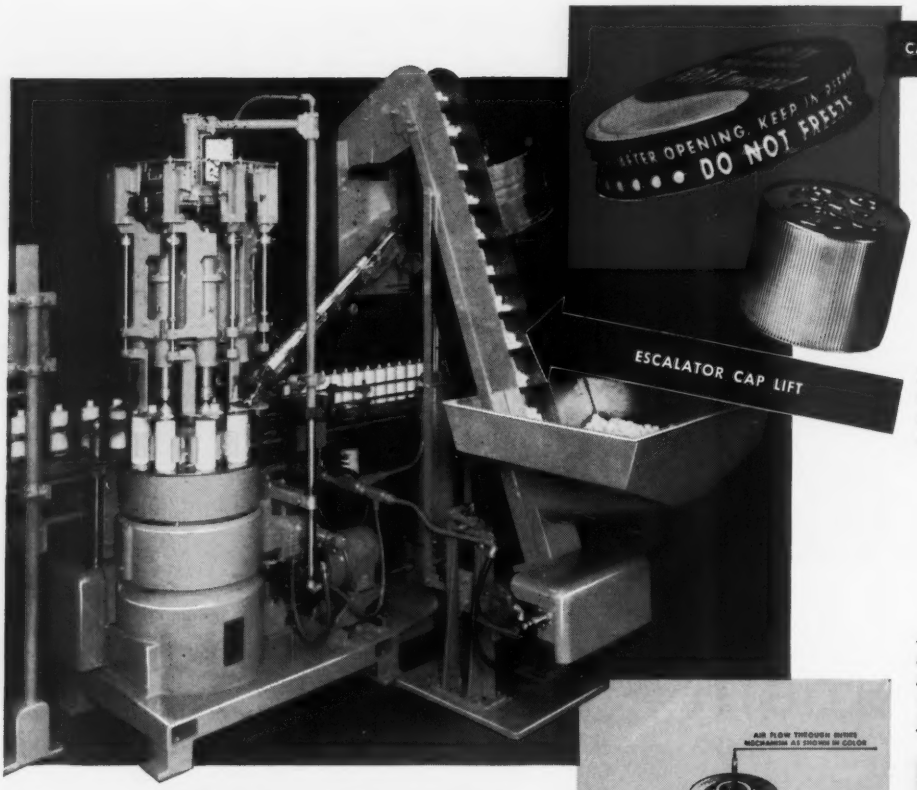

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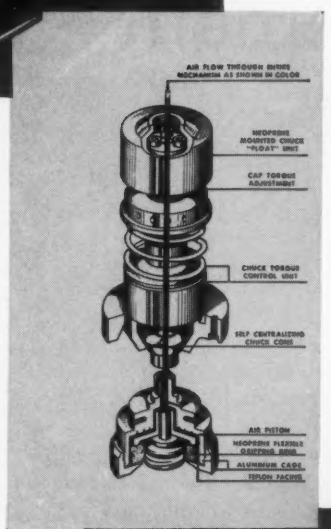

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tributed a single damn dime to the cause. Nobody saw the need.

How are the smaller companies going to resist the enormous economic pressure that can be exerted by the big companies? A few years ago Procter & Gamble provided a good example of such economic power when they invaded the tooth paste market with, not one, but two tooth pastes: Gleam and Crest. Lilly had globin insulin in the hands of every doctor in the U. S. A., before Burroughs Wellcome, which claimed to have discovered it, could turn around. Lederle spent $2,000,000 in a one-shot sampling of Aureomycin. How many firms could match that even if they had identical products? Speed is getting to be of primary importance in getting a product on the market, and the big firms with big detail forces and lots of money can exert enormous pressure on the smaller ones. Is the whole of the drug industry destined to be swallowed up by five or six big companies as happened in the automobile industry? I hope not.

How are we going to police our industry with respect to advertising claims and marketing practices to forestall attacks upon the industry by the Government, the medical profession, the press, and the intelligentsia? No need to tell you about the Kefauver hearings or the attacks upon our industry by the New York *World Telegram* and John Lear of *The Saturday Review*. There is no telling now what influence these attacks will have on the mode of operation of our industry, but these attacks may force serious changes in management procedures and practices.

Will the luck of the industry continue indefinitely? As I said, only a fool would deny the role of luck in the affairs of men. It was luck that brought us the sulfonamides from Germany; luck that gave the sulfonamides such nation-wide publicity through the illness of the son of the President. It was luck that brought us penicillin from England—for nothing—and started the antibiotic part of our business. It was luck that made the drug industry the source of supply for the whole world during World War II. It was luck after the war that people began to breed like rabbits, creating an unanticipated market for all manner of drug prdoucts. How long will the luck of the industry hold, and what will happen if the onward surge of the industry slows down and the inefficient firms that have been riding the wave of the future are faced with a fight for survival?

Another change rapidly taking place in the industry is the passing of family-owned companies and the slow emergence of professional managers. Estate taxes did that. Some of these companies—not many—were well managed by the generation that succeeded the founders. The Lillys, Upjohns, Searles, Beardsleys, and Bristols are cases in point. Of many family-owned companies, the less said the better. In them, management was nonexistent. They succeeded by luck and the onrushing surge of the industry, which carried them along in spite of themselves.

The eventual dominance of the industry by professional managers will be good for everybody concerned. The insurance companies, the big banks, the Bell Telephone system, the public utilities; many of the big industrial companies such as Eastman Kodak, General Electric, General Motors, and many others, are directed by professional managers who have done, on the whole, an excellent job.

One effect of the passing of family control is the broadening of stock ownership. As time goes on, companies will be operated more and more by professional managers owning a very small percentage of stock in the enterprises they are administering, but able to control these enterprises and solidfy their positions through control of a substantial percentage of proxies. Obviously, there is danger in this in that unscrupulous professional managers can, through stock option plans and bonus gimmicks, reward themselves excessively without fear of stockholders whose individual holdings are small and whose geographic positions are scattered. But I don't think this danger is as great as continued control by families that have gone to seed.

The Sixties will present challenges to management of a magnitude never before encountered. The companies, whose presidents are professional managers, that is, men skilled in the art, the science, and disciplines of administration, will fare well. God help the rest!

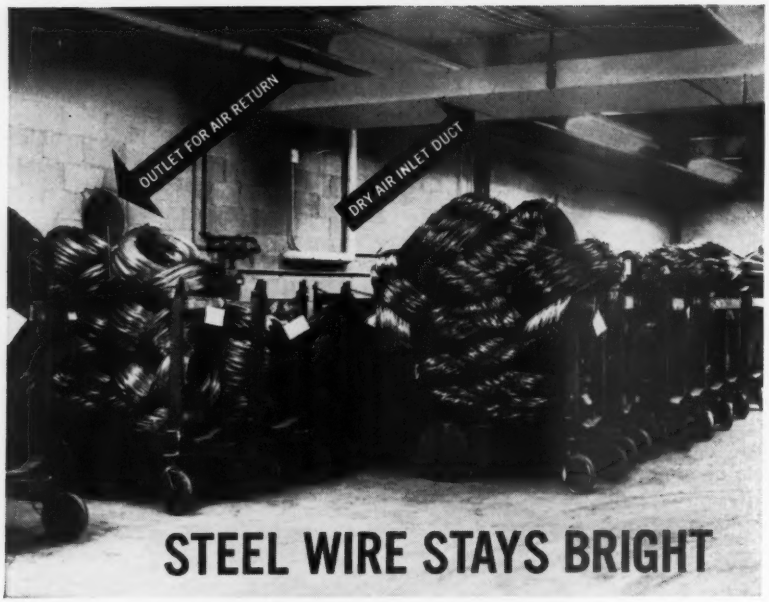
Are We Headed For A Planned Economy?

"This kind of argument is being made: By central direction of its economy, the United States vastly increased its output during World War II. Now, it is said, we are faced with a similar challenge. We should, it is maintained, prune away, by Government action, some of the frivolities of our free economy, adopt a program of austerity, and by some form of central direction channel a greater share of our resources to capital investment.

"Let us examine this argument carefully; there is a persuasive sound to it.

The United States temporarily adopted central direction of its economy during the two great wars, firm in the belief that freedoms temporarily surrendered would be taken up again at the close of the war. The first war lasted two and a half years; the second one lasted four and a half. The desire for freedom was kept alive during these relatively short periods; when the wars were over we again took up our freedom, only slightly impaired by its temporary and partial eclipse.

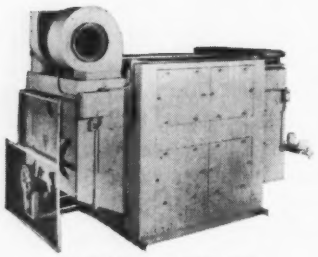
"What is the probable duration of the economic rivalry between the United States and the Soviet Union? This may be a rivalry whose duration is to be measured in decades or generations rather than in years. No man can say how long it will be; no man



STEEL WIRE STAYS BRIGHT IN DESERT-DRY WAREHOUSE

A LECTRODRYER maintains an average relative humidity of 16% the year around in Keystone Steel & Wire Company's storeroom at Peoria, Ill. As a result, bright steel wire exposed there to the atmosphere for a month was in excellent condition when received by the customer. Prior to dehumidification of the storage area, wire would begin to tarnish in a day or so.

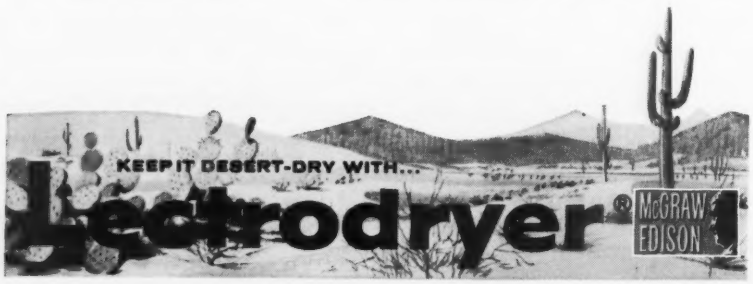
A DRY warehouse may solve your storage problems



New Type CH Lectrodryer

Hundreds of companies use Lectrodryers in a similar manner to dehumidify storage and work areas, thereby safeguarding products during warehousing, processing or packaging.

FOR CASE HISTORIES on these and for any other drying problem answers, write Pittsburgh Lectrodryer Division, McGraw-Edison Company, 309 32nd Street, Pittsburgh 30, Pennsylvania.



would predict that it will be brief.

"Could we put freedom aside for decades, and then reinstate it? If a whole generation were deprived of freedom or had its freedom substantially impaired, would freedom be sufficiently cherished so that we would return to it? Would the desire for freedom be strong enough to shatter a pattern of regimentation, laid down and congealed over a period of decades? To put these questions to the test would place in jeopardy our most precious heritage. It would demonstrate that we hold in low esteem the capabilities and the merits of our free system.

"We need to be reminded that economic freedom, extended to all the people, is a relatively new concept in the world's history. It has emerged only in recent centuries, only in parts of the world, and only at immense cost. It is not the kind of system which can be put in escrow. It must be practiced if it is to be kept alive. This system, which has rewarded us beyond our brightest dreams, deserves better than that we should voluntarily impair it through fear of a still-distant competitor.

"The President has expressed utmost confidence in the ultimate victory of representative government and an enterprise economy. The Vice President has said we can win this horse-race with the Soviet Union, provided—and I emphasize this—provided we don't try to ride their horse.

"While we should recognize and respect the economic capabilities of the Soviet Union, we should not underestimate our own capabilities and our own strength. These are immense, presently more than twice those of the Soviet Union.

"To promote the right kind of solid growth is a shared responsibility, a responsibility which rests upon private persons and local and state governments as well as the Federal Government.

"The Federal Government cannot long force a high rate of economic growth upon us unless basically the people want it. And if we want it, which we should, there are many ways to bring it about besides making it the sole responsibility of the Federal Government.

"The Federal Government can help provide a climate within which enterprise and economic growth can flourish. It can round out and supplement the efforts of state and local governments in the development of human and natural resources, being careful in the process not to preempt, substitute for, or discourage local and state efforts. It can pursue sound fiscal and monetary policies. It can help create a climate favorable to savings and investment. It can develop policies which will put money to work and men to work. It can create a setting which is in harmony with the objectives of you who encourage the people to invest in America. The Federal Government cannot, singlehanded, take responsibility for producing a specific rate of economic growth.

"How can we improve the performance of the American economic system? There is no mystery about it. The key is the preservation of the initiative, vitality, energy, and resourcefulness of our people.

"Enhanced economic performance comes from these solid sources, not from politically motivated spending in behalf of ever greater centralization of governmental power and authority, and certainly—most certainly—not from the adoption of techniques alien to our system."

Don Paarlberg
The Wall St. Journal
May 3, 1960

Building Profiles

"Some industrial companies may not wish to relocate in the suburbs. To many, the advantages of in-city locations—availability of labor, accessibility to customers and suppliers, availability of utilities, services and necessary facilities—offset the obvious desirability of 'industrial park' locations. A recent study of the industrial properties in one of our older and larger cities shows that it is often more advantageous for a company to expand into a renovated older building than to move into a new plant. Given certain basic essentials, even the most dilapidated industrial structure can be revamped at considerably lower cost than is entailed by new construction.

"A new method resulting in what is called the 'Building utility profile,' makes it easy to measure the industrial potential of any building. In brief, the method involves first, objective analysis of the building and its site, and then codification of the findings into a graphic summary. From the graph, or 'profile,' the over-all quality of the building can be judged immediately, and major advantages or disadvantages can be singled out on closer inspection. Building profiles can be analyzed individually or in comparison with others.

"After a building is selected for study, it is evaluated in terms of its size, shape, age, and type of construction; floor space and number of floors in relation to the area occupied; foundation bearing walls, and other structural features; floor loading capacities and ceiling heights; number and capacity of elevators; availability of services and utilities etc. The data are recorded on a standard form which indicates the relative importance of each factor and can be readily transferred to punch cards for further processing, tabulating and sorting."

Industrial Bulletin
Arner D. Little Co., Inc.

Automatic Filling Machine

The National Instrument Company, Inc., 4119-4127 Fordleigh Road, Baltimore 15, Md., has developed a new Filamatic Automatic Liquid Filler which features an improved indexing and bottle positioning mechanism.

The solenoid-actuated mechanism formerly used has been replaced by indexing and positioning fingers actuated directly by cams on the main crankshaft,

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which minimizes maintenance and results in trouble-free operation.

The bottle positioning centers each container precisely, and the Filamatic base is now entirely enclosed and mounted on locking type casters, making the unit portable.

Available with two or four spouts to provide a filling rate adjustable from 0 to 60 or 0 to 120 fills per minute, the mechanism's conveyor belt speed is adjustable from 0 to 50 feet per minute by an electronically controlled, variable speed drive. Interchangeable pump assemblies provide a filling range from 1/30 to 8 oz. All liquid contacting parts are fabricated of type 18-8 stainless steel.

Automatic Case Opener, Positioner, Packer

A-B-C Packaging Machine Corp., Tarpon Springs, Fla., has introduced a new high-speed case opener, positioner, and packer that is fully automatic, for packing rectangular cartons or cans. It has positive automatic feed with no operator required, and can be made adjustable with production capacity up to 25 cases per minute.

The unit comes with handles of all types, stapled, glued, or stitched; it requires no special shipping cases or tolerances; and it will run standard mill shipments of corrugated cases, as well as automatic accumulation of a wide variety of carton loading patterns.

Conveyor-Line Marking Attachment

Adolph Gottscho, Inc., Hillside 5, N. J., has introduced the Rolacoder, a conveyor-line case, carton, and can marking attachment equipped with the company's new Magic Inker. Up to 250,000 markings without adding ink is claimed to be possible. The inker is a replaceable ink-impregnated ink roller that applies a thin film of ink to the rubber type in the marking attachment after each impression is applied. Made of Porelon, a micro-porous plastic produced by S. C. Johnson & Son, Inc., the Magic Inker is discarded and replaced with a fresh roller when it runs dry.

Automatic Fitment Applicator

A fully automatic fitment applicator for installations where the fitment is the sole closure has been enginered by Resina Automatic Machinery Company, Inc., 572 Smith St., Brooklyn 31, N. Y. Straightline operated, the Resina Model FAB is easily integrated into any conveyorized packaging line following a filling machine. It handles solid or perforated plastic fitments, orienting them from a hopper into a chute. The passing container picks up the fitment, which is then firmly fixed onto the container. Containers are gripped by rubber-faced belts during the entire operation, which prevents spillage.

Changeovers take a maximum of 10 to 15 minutes and the unit applies from 20 to 120 fitments per minute, depending on container size. Machines are available with capacities of up to 300 applications per minute. Power is supplied by a ¼ HP motor for the hopper and a ½ HP motor for the conveyor.

Container Feeder

U. S. Bottlers Machinery Company, 4015 North Rockwell St., Chicago 18, Ill., has announced a new container feeder, by means of which the operator simply dumps containers on the unscrambler belt and the machine feeds containers to the packaging line at any speed at which the line can absorb them. The unit has instant speed regulation, and precision feeding assures smoother, steadier packaging even at high speeds. It handles round, square, panel, or oval shapes, in glass, cans, or jars, and allows quick adjustment to container size changes.

The feeder is built on a rigid steel frame with steel-enclosed sides. Its mechanism has a minimum of wearing parts and requires minimum service.

Foamless Five-Gallon Filler

Packer Machinery Corporation has made available a Model SFRT foamless, dripless liquid gravity filler that is pneumatically operated with air-valve control. The unit, available in fully or semi-automatic operation, has as its features a roller conveyor and specially designed bottom-up filling nozzles. It is made specifically for packaging foamy products in five- and one-gallon containers.

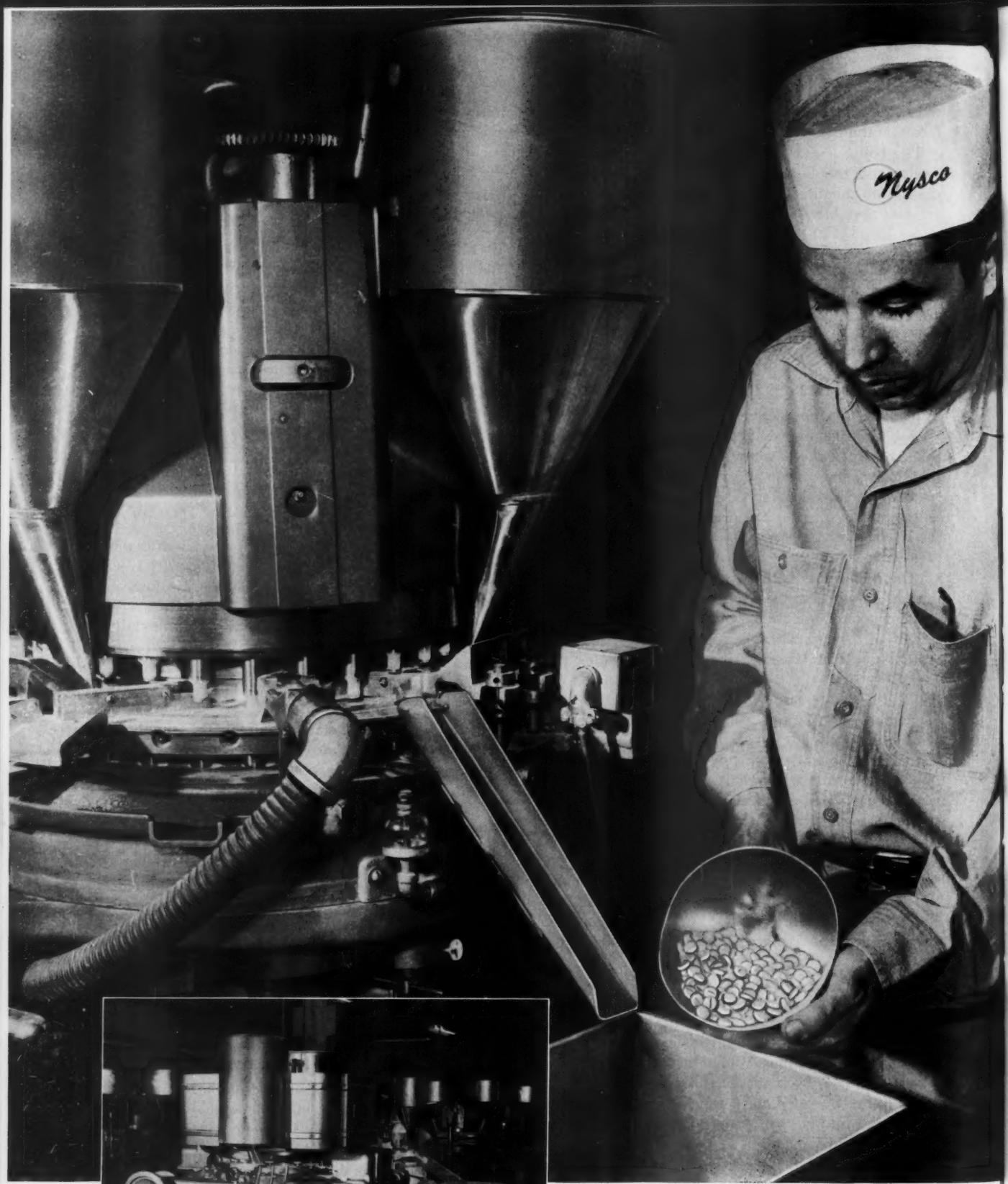
All models are equipped with six stainless steel bottom-up filling spouts that eliminate the foam problem, clear plastic tubing, contact parts of stainless steel, a roller conveyor, and a liquid control tank or manifold.

Capsule Filling and Sealing Machinery

Two machines for filling and sealing capsules have been developed by N. V. Leidsche Apparatenfabriek, of Leiden, Holland. The first, a dosing and filling device, permits accurate proportioning of powders or liquid drugs; handles hygroscopic, fine-grained, or amorphous powders easily; and can be adapted for processing liquids by a finger-tip control. Powders can be proportioned in quantities from 60 to 5,000 mg., liquids, from 4 to 50 ml. A semi-automatic or fully automatic unit for filling gelatin capsules is available for mounting under the dosing unit. It opens the closed capsules, conveys them to the hopper, seals them when filled, and discharges them at an adjustable rate of up to 3,000 capsules per hour.

The sealing machine hermetically seals closed gelatin capsules with a glued strip that can be given a color code. After the sealing edge of the capsule is bonded with glue, the capsules are conveyed to a drying rack, shifted intermittently in an air current, and discharged dry into a reservoir so that they do not touch each other.

Information is available from the Netherlands Trade Commission, 551 Fifth Ave., New York City.



▲ A multi-layer tabletting machine—Model 566—is used to form a three layer aspirin—TRIPISIN.

◀ Stokes Model 533 produces 900,000 throat lozenges during a ten hour working day.

Compounder's Corner

Snails in Cosmetics

G. Brambilla, P. Rovesti, and A. Tossato presented a paper on the use of edible snails in cosmetics at the 13th International Congress on Beauty Treatment and Cosmetology in Lucerne, September 14 to 17, 1959. The authorized translation of the paper is published in *Soap, Perfumery & Cosmetics,* vol. 33, p. 493, May 1960.

Sections of the paper cover historical, physiological, biochemical, and experimental data, and cosmetic tests. The edible snail considered is *Helix pomatia L.,* bred commercially in Austria, Germany and France. Historical references start with Galen, who stated that snails removed from their shells and ground to a powder were useful in wound healing, as internal emollients, for curing inflammation of the air passages and as anti-hemorrhagics. Mattioli in the sixteenth century asserted that the ground up flesh of snails healed bruises and wounds. Caterina Sforza and Isabella Cortesa advocated the use of snails in facial packs "to make the visage smoother, whiter, more pearly." Physiologically, the slime of snails seems to have water-retaining properties and Italian folk-lore is cited for the use of the material in wound healing. In Brianza snails are eaten to alleviate gastric ulcer pains; in Abruzzo, homogenized snails are used in the treatment of coughs, in Calabria a decoction is prepared for ophthalmic use, in the hills of Tuscany, it is used for making the skin of the hands soft and to ward off chilblains.

The principal constituent of snail slime seems to be a mucoprotein which when dry is an amorphous white powder, almost insoluble in water, salt solutions and organic solvents, but soluble in dilute alkali. Experiments were performed with homogenized snail material free from shell and with mucin from snails, incorporated in creams and facial packs. Applying the product to one side of the face, treating the other side with the blank carrier, greasy skins became less greasy, dry skins "improved greatly and acquired turgidity and velvetiness. Mixed skins enjoy both advantages." Acne was improved and "It is remarkable what a sense of freshness and hydration these preparations give."

Comment: Of course there is an element of plausibility in this "study," but the critical point, the experiments proving that the preparations have some value, is brushed over lightly and gently. The number of subjects tested was not mentioned in the translation, the objective criteria for determining improvement were not described, if, in fact, there were any. European "research" in cosmetology would be quite a bit less assertive if it had to abide by rules set down by a Food and Drug Administration or a Federal Trade Commission.

Antibacterial Fabric Softeners

The incorporation of a highly active antibacterial agent, phenylmercuric propionate, into an aqueous solution of a fabric softener of the quaternary ammonium type results in a most effective antibacterial laundry rinse additive according to W. M. Linfield et al of Armour and Co. (*J. Amer. Oil Chem. Soc.* 37:248, 1960). The presence of the quaternary ammonium compound appears to enhance the antibacterial activity of the mercurial. When applied at a level of 63 parts of available mercurial to one million parts of fabric, the treated cloth is rendered bacteriostatic to several strains of *S. aurens* and to ammonia-producing organisms of the *Proteus* group, also mildewstatic to *Chaetomium globosum.* The formulated antibacterial softener as well as the treated linens appear to be entirely safe to humans.

In longer-term application tests in a hospital laundry the total bacterial load carried by the soiled treated linens is practically zero. There is no excessive build-up of antibacterial agent on fabric upon repeated applications, and it is readily washed out of the fabric by conventional laundering.

Antibacterial Synergism

Mixtures of hexachlorophene and trichlorocarbanilide or bithionol and trichlorocarbanilide in soap show a marked synergism with respect to antibacterial properties according to W. M. Linfield, R. E. Casely, and D. R. Noel (*J. Amer. Oil Chem. Soc.* 37:251, 1960). In both cases the approximate ratio of 50/50 of the two components represents an optimum.

Nonionic detergents enhance the antibacterial activity of trichlorocarbanilide *in vitro* when present at relatively low levels. At higher levels of nonionic the antibacterial agent is neutralized and loses its effectiveness.

The antibacterial activity of the pair hexachlorophene-trichlorocarbanilide extends over a wide spectrum of micro-organisms, and synergism is shown with each test organism.

High antibacterial activity of the synergistic pairs in soap is shown both in *in vivo* handwashing studies and in subjective deodorant tests.

Synthetic Waxes

A new series of synthetic wax has been announced by Commercial Solvents Corporation for application in polishes, leather, paper and textile finishes, metal working lubricants, cosmetics and pigment grinding assistants. Generically, these are oxazoline waxes. TX-1 is hard, high-melting, rosin-like and emulsifiable, light brown in color and translucent. TS-254 is hard, medium-melting, emulsifiable and cream colored. Both form true solutions in many organic liquids and form stable gels or pastes at higher concentrations. The chemical structure of the waxes imparts unusual properties of adhesion, lubricity, and wettability and four other grades besides those mentioned are available.

Stokes Model 533 produces 900,000 throat lozenges during a ten hour working day.

(*Continued from page 753*)

slowly soluble and absorbed substances would probably also be proscribed. These materials are likely to act as foreign bodies and produce some degree of irritation or, as in the case of mineral oils, produce a type of lipid pneumonia. In some cases, the degree of solubility determines the method of administration. For example, materials in suspension form are not given intravenously because of the danger of occluding some vital artery. They may be given subcutaneously or intramuscularly, however, since they are slowly soluble in body fluids and absorbed accordingly. Without studying some specific material, it would be difficult to estimate the critical length of time that a material might remain undissolved in the alveolar space without causing some tissue damage. It should be pointed out, of course, that the body does possess mechanisms for removing insoluble materials deposited in the alveolar sacs. The question then concerns the efficiency of these mechanisms. For instance, carbon particles deposited in the lung from atmospheric air are gradually removed by various types of tissue cells which engulf them and prevent harm. In the case of large quantities of these particles, however, the mechanism breaks down and fibrosis of the tissue frequently results.

If it is determined that a material may be used by inhalation into the lungs, then the next step is to obtain an aerosol of the optimum particle size. This optimum range is between 5 and 0.5 microns. And, since dosage is usually of primary concern, then it is absolutely necessary to obtain 100 per cent of the particles within this size range. Larger particles would deposit on mucosal surfaces and be slowly absorbed, while smaller particles would be expelled. The former would defeat the purpose of inhalation therapy, whereas the latter would result in inadequate dosage.

In regard to particle size, two other physiological factors must be mentioned here. First of all, the respiratory system functions as an efficient humidifying mechanism. It is obvious, then, that hygroscopic materials would tend to increase in size when introduced into the lungs. Secondly, if a material capable of causing broncho-constriction were inhaled, then the resulting narrowed lumen of the airways could conceivably reduce the amount of drug reaching the alveolar spaces.

Finally, it should be pointed out that the rapid absorption of materials by the lung depends upon the efficiency of the absorption surface. If the lung is affected by some disease process, then absorptive efficiency is reduced. For example, in pneumonias, up to 75 per cent of the alveolar spaces could be rendered useless for either respiratory or absorptive function. It is necessary to consider the presence of pathological pulmonary conditions when aerosol inhalation therapy is being considered for anything other than its local effects.

The atomizer, nebulizer, and vaporizer have been successfully used for many years to produce finely subdivided liquid or solid particles of medicinals for administration by inhalation. By passing a fast-moving stream of air over a thin capillary tube immersed in a solution of the medicinal agent, a vacuum is produced. This allows the liquid to rise in the tube and be blown against a baffle, which breaks the stream into smaller particles. This is essentially the way an atomizer and nebulizer operate. An atomizer ordinarily produces larger sized particles and these particles are generally too large to be used for inhalation therapy of the lungs. The nebulizer, however, is restricted to a special type of atomizer in which the large particles are removed by introducing a suitable baffle into the construction of the atomizer. The mist produced in a nebulizer contains practically no particles that will wet a nearby surface. The particles are practically all below five microns in radius. The propellant for both the atomizer and the nebulizer is air, produced by squeezing a rubber bulb.

The vaporizer makes use of steam, which is passed over a volatile liquid, causing a conversion from the liquid to the gaseous state. Needless to say, a vaporizer cannot be used for nonvolatile substances such as penicillin, epinephrine, etc., and has very little, if any, use in inhalation therapy.

While the nebulizer produces a spray or mist of the desired particle size, it still leaves much to be desired. The nebulizer is bulky, requires cleaning, is not convenient to use, and may cause contamination of the medicinal. There is also present the danger of either over- or under-medication, since there is no accurate control of dosage. (Dosage is controlled somewhat by adding a given number of drops of medication to the nebulizer). However, the nebulizer is still used to a great extent for inhalation therapy, especially in the control of bronchial asthma and other similar conditions. Penicillin and other antibiotics have been administered via inhalation through use of a suitable nebulizer.

Powders can also be administered by inhalation therapy through use of suitable devices. One such device makes use of a metallic ball moving in a narrow tube. The patient inhales, causing the ball to rise and strike a small cartridge containing the finely subdivided powder. A small quantity of powder is released and carried with the inspired air to the throat for local therapy and into the lungs for both local and systemic therapy.

With the introduction of liquefied gas aerosols, thought was given to the utilization of the "aerosol" principles for the application of medicinal agents by inhalation. Several advantages over the conventional type nebulizers became immediately apparent. The medicinal agent could be mixed with the propellant, thereby forming a self-powered unit capable of producing a spray or mist of the desired particle size. Since the package was sealed, there would be no danger of contamination or decomposition of the

(*Continued on page 830*)

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CONOCO **WHITE OILS AND PETROLATUMS**

(*Continued from page 751*)

toxicological investigations of cosmetic ingredients, like those of food additives, are aimed toward establishing the conditions of safe (that is, nonhazardous or harmless) usage. This is in contrast to studies of drugs whose purpose is to establish pharmacologically effective levels. The difference in these objectives is critical in relation to the experimental design.

The planning and interpretation of animal experiments must take into account the route, form, amount, frequency, and duration of administration or application of the test material compared to its practical use conditions. An adverse effect induced in animals under deliberately exaggerated dosage does not per se signify harmfulness under normal use.

In the light of recent history with the Food Additives Amendment, the toilet goods industry is cautioned to examine carefully the language of proposed cosmetics ingredient legislation from the point of view of (a) its effect on ingredients with a long history of apparently safe use, and the degree of "expert" appraisal on which the assessment of this history will depend; and (b) the nature of "scientific evidence" that will be required to establish safety in use, particularly with respect to potential allergens or suspected carcinogens.

Dr. L. W. Hazleton and Dr. J. R. Elsea presented "A Review of Product Development Problems Under the Federal Food, Drug, and Cosmetic Act."

Some members of the "regulated" industries are quite familiar with their own particular field, but may be unaware that other significant industries face almost identical problems in developing new products. A history of some 20 years of regulation under the Federal Food, Drug, and Cosmetic Act of 1938 provides material of common interest and of equal significance to members of the food, drug, cosmetic, and pesticide chemical industries.

During these two decades, little in the way of really new concepts has been introduced into the safety evaluation "requirements" of the regulatory agencies. Rather, there has been a progressive pyramiding of these "requirements" in terms of animal numbers, species, and duration of study, with the philosophy that more and more data will provide theoretical assurance of absolute safety. This trend has effectively discouraged some groups in industry from developing new products, due to the excessive time and cost involved in satisfying the biological demands as compared to the returns that could be anticipated. If we are to reverse this trend toward lower output and increased costs attendant upon our scientific research and development, we must turn to research in methodology and to the development of appropriate procedures to gain recognition for such improved methodology. Since no one industry faces this problem alone, it is essential that, for maximum benefit to result, any solution to the problem should not be undertaken from the limited viewpoint of any single regulated industry, but rather on a cooperative basis.

Dr. A. J. Lehman, in "Toxicological Aspects of Certain Types of Cosmetics," considered the recent trend in cosmetic products to introduce pharmacologically active ingredients into formulations (page 748).

Dr. Herbert Heinrich and John E. Clements reported, in "Usefulness of Rheology in Cosmetics," on the use of a newly designed viscosimeter giving new data and permitting control of a variety of cosmetic preparations.

Dr. James W. Johnston, Jr., and Armando Sandoval, in "Organoleptic Quality and the Stereochemical Theory of Olfaction," reported that experiments have been performed to test a basic theory of smell which states that human beings have at least seven odor primaries, and that pure compounds which possess two or more odorant qualities are complexes of "primaries." A pair of specially synthesized pure pimelic esters were presented to trained odor judges by means of two olfactometers that maintained vapor purity and delivered several concentrations of the odoriferous stimuli. It was found that the esters are bland and have weak odor power, which made nasal analysis difficult, even with saturated air. Nevertheless, the judges' descriptions of the esters tend to uphold the predictions by J. E. Amoore that the parent compound would smell fruity and its homolog should have an ethereal component. New methods of testing and training the judges have been developed to prepare them for the next two olfactometric experiments. These require a good odor memory and the ability to perceive and identify correctly the primary standards at rather weak concentrations of vapor. Highly competent descriptions of two pairs of lactones with distinct odor power are needed to reach a clear judgment of the validity of the stereochemical theory of smell. The practical value of this training should extend beyond the use of odor judges in theoretical work, to developing reliable descriptions of the odors of a great variety of chemical compounds.

Dr. Edward J. Masters, in "The Percutaneous Absorption of Estrogen," reported the results of studies on the effects of the topical application of a cosmetic hormone cream base containing 10,000 I. U., 20,000 I. U., and 40,000 I. U. per ounce, respectively, of natural estrogenic hormones. Amounts of estrogen up to 80,000 I. U. per month were applied. The absorption of estrogen was measured by analysis of estrogens in urinary excretion of postmenopausal women. Systemic effect was evaluated by vaginal smear.

No significant absorption was observed at levels of application of 20,000 I. U. to 40,000 I. U. of estrogens per month.

The safety of using a hormone cream containing 10,000 I. U. of estrogen per ounce was thus confirmed. •

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Perfumer's Shelf

Zanthoxylum Alatum Oil

Zanthoxylum Alatum which is known alternatively as Tumru in Hindi is one of the common and well-known flora of the large family of the Rutaceae growing wild in the hilly tracts of India. It is found throughout the hot valleys of subtropical Himalayas, Khasi and Naga hills and the hills of Ganjam and Vizgapatam. It grows as a shrub or a small tree with a strong aromatic smell. Leaves of this plant like those of many other plants of Rutaceae family are dotted with oil glands. Various-parts of the plant find use in Indian medicine. The seed and bark are used as an aromatic tonic in fever, dyspepsia and cholera. The green branches are used as aromatic tooth-brush sticks and the seeds are used in tooth-powders. The leaves of the plant, however, remain unutilized and go to waste in huge quantities every year.

The fruits and bark are known to contain essential oil. The oil from the carpels has been described as comparable with turpentine oil and is like eucalyptus oil in odor and properties, an antiseptic, a disinfectant and a deodorant. The oil from the fruits has been studied by Schimmel & Co. and by Simonsen and Rau. The former obtained it in 3.7 per cent yield and identified *l*-sabinene as its chief constituent, whereas the latter obtained it in a yield of 1.5 per cent and identified *l*-α-phellandrene as the major constituent and linalool as a minor component. The essential oil from the leaves of the plant does not appear to have been studied earlier.

For the present investigations by I. C. Nigam and D. R. Dhingra (*P. & E. O. R.* 51:246, 1960) the leaves were collected in the month of September in the neighborhood of the village of Lohba, in the Garhwal district and were hydro-distilled the next day. The yield of the oil was 0.04 per cent. As indicated by the physico-chemical constants, the carbonyl compounds appear to be the main component (43.99 per cent); next being alcohols (19.5 per cent), and esters (10.67 per cent). About 13 per cent sesquiterpenes are also present. For identification of the components, the oil was fractionally distilled under reduced pressure. Examination of various fractions revealed the presence of methyl nonyl ketone as the main component. The alcohol was identified as linalool and the ester appears to be linalyl acetate. A substance, having the empirical formula $C_{10}H_{16}O$, was isolated from the residual fraction but it could not be identified. Some unidentified sesquiterpene hydrocarbons were also isolated. The residue contained a waxy material, which was isolated and identified as the paraffin, tricosane.

Sex and the Sense of Smell

At least in mice, the sense of smell may have an even more profound sexual effect than attraction alone. A report by H. M. Bruce and D. M. V. Parrott (*Science* 131:1526, 1960) describes an interesting set of phenomena. When newly mated female mice are placed with or near strange males, pregnancy fails to develop in a high proportion of the females. Definite physiological changes take place: development of corpora lutea (necessary for pregnancy) is inadequate, implantation does not take place and estrus returns in 4 or 5 days after stud mating in more than 90 per cent of the females. At this time, fertile mating will take place if the strange male has access to the female. If the female is returned to her original stud male 24 hours after separation from him, pregnancy continues normally. "The primary stimulus initiating the reaction is almost certainly olfactory, but direct proof of this assumption has so far been lacking."

Experiments were carried out in which olfactory bulbs were removed from female mice, depriving them of the sense of smell. When these females were exposed to strange mice after mating, they remained pregnant. Loss of olfactory bulbs also caused physiological changes such as regression of the ovaries and uteri, alteration in mating behavior, and disturbances in reproduction. Quite explicit in these experiments is the effect of the sense of smell on sexual behavior.

It should require only mild exercise of creative writing ability on the part of a skilful advertising copy writer to apply these findings, subtly or otherwise, to persuading a female (or male) subject that perfume can be specifically helpful in affecting members of the opposite sex, when they are free from colds.

Lilac Perfume

No absolute lilac oil exists and a large number of natural and synthetic substances is used in the compounding of this perfume. Terpineol is employed in most of these formulas, in refined compositions as well as in their low-priced counterparts. Even the best qualities of terpineol are inexpensive.

Because the raw material is cheap, good lilac formulations may be offered at a comparatively low price according to H. Voisin (*P. & E. O. R.* 51:249, 1960, from *Kosm. Parf. Drog. Rundschau*). Phenyl ethyl alcohol and cinnamic alcohol are closely tied with the terpineol in the duplication of the characteristic lilac note. In addition to these basic elements, linalool, hydroxycitronellal, ylang, and other oils are lilac-type bases, and a jasmin-note produced by additions of amyl-cinnamic aldehyde, benzyl acetate, indole, etc., is added to balance the formula.

In the formulation of expensive lilac perfumes the oils of jasmin and tuberose are added. The personal taste and experience of perfume compounders is a ruling factor concerning the percentage of violet,

rose orange and narcissus (daffodil) oils added, which are admixed with a trace of cassia. The flowery note of lilac can be enhanced with tiny additions of linalool, hydroxycitronellal and ylang. Sometimes traces of sweet orange oil have been found useful in these compounds.

A fresh note can be produced with tiny additions of cyclamen aldehyde. Bergamot oil serves the same purpose. Coumarin, heliotropin and vanillin indicate a sweetish character. To balance the composition and increase its 'warmth' traces of carnation oil are useful, while a further addition of benzaldehyde creates the final, natural fragrance. These substances are fixed with musk, benzoin, and, sometimes, amber.

In the dilute state terpineol is indicative of lilac, yet it is unable to induce the true lilac fragrance because it lacks the flowery note.

Therefore, excellent results can be achieved by enriching the terpineol with a suitable flower fragrance in which some natural jasmin and tuberose is included. A combination of terpineol and hydroxycitronellal is, therefore, a suitable base for lilac compounds, since the last-mentioned product enhances the flowery note and blends very well with the other addities. The value of hydroxycitronellal in this instance is increased by an addition of linalool.

The synthetic compositions suitable for the compounding of lilac perfumes are particularly interesting. Dimethyl benzyl carbinol exhales a characteristic lilac note and makes an excellent fixative which is highly compatible with other substances.

An addition of phenyl propyl aldehyde causes the flowery note to last.

Another useful addition is phenyl propyl acetate which develops a pleasant background bouquet. Cinnamyl alcohol exhales a delightful, delicate fragrance indicative of hyacinths. It makes a good base which serves the fixation and balance of the bouquet.

To further enhance the flowery lilac note, additions of anise aldehyde, acetophenone and ionone are employed. Traces of benzaldehyde work in the same manner. Benzylidene acetone and phenyl acetic aldehyde are comparable in action and should also be used in traces only. Benzyl acetate, benzyl propionate and alpha-amyl cinnamic aldehyde are suitable background bases where jasmin is a characteristic odor note. If a pronounced variation in character is desired, methyl anthranilate may be used instead of neroli oil, and phenyl ethyl alcohol instead of rose oil.

Natural tuberose may be substituted by n-dodecyl aldehyde (lauric aldehyde). Even small doses of this substance provide the characteristic tuberose fragrance; simultaneously they freshen the flowery note of the entire composition. Suitable agents of fixation are musk ambrette and musk ketone.

In apparent contradiction to the above it is a startling fact that an excellent lilac perfume can be produced with a tiny quantity of terpineol only, or with no terpineol at all. A suitable balance in the compound may, nevertheless, create the true fragrance of natural lilac and avoid the acridity of perfumes which include excess terpineol.

Tablet Lubrication

It was found by J. B. Appino, G. S. Banker, and H. G. DeKay (*Drug Stand.* 27:193, 1959) that suspending certain lubricants in appropriate granulating agents results in granulations which may be readily compressed on a single punch tablet machine. Furthermore, the incorporation of lubricants in the granulating agent may actually produce tablets with a better appearance than those produced by the conventional method of adding the lubricant to the dry granulation. Magnesium stearate (3 per cent) and Sterotex (5 per cent) incorporated in the granulating agent produced lubrication which was as good as or better than that produced when they were added to the finished granulation. Talc (10 per cent) was effective in starch paste but not in keltose or simple syrup; whereas liquid petrolatum was ineffective in all granulating agents studied.

Magnesium stearate, talc, and Sterotex, when incorporated in the granulating agents, had little effect on the granulating agent binding properties as determined by the concentration of fines in the finished granulation. Liquid petrolatum, when emulsified with the granulating agents, materially decreased granulating agent binding properties. Magnesium stearate, incorporated in starch paste, decreased the disintegration time of the tablets produced over the conventional method of lubricant incorporation. The method of lubricant incorporation with talc and Sterotex had little if any affect on tablet disintegration time.

Antiseptic Cold Creams

Three stable typical borax emulsion creams (cold creams), and two formulated o/w borax emulsion and glycerylmonostearate creams were incorporated with increasing amounts of variout bacteriostatic agents by E. Menczel and S. Mel (*Drug Stand.* 28:40, 1960). Significant concentrations of benzalkonium chloride, hexachlorophene, phenol, and sorbic acid adversely affected the stability of the cold creams whereas chlorocresol, chloroxylenol, and 8 - hydroxy - quinoline sulfate, even at 5 per cent concentration, did not alter the stability of the tested cold creams.

The results of the agar cup plate bacteriostatic tests using *Staph. aureus* and *Esch. coli*, indicated that the incorporated chlorocresol, chloroxylenol, hexachlorophene, 8-hydroxyquinoline sulfate, and phenol exert similar antibacterial activity from both w/o cold creams and o/w borax emulsion cream, as well as from o/w glyceryl monostearate cream. Sorbic acid proved to be more effective in o/w creams; benzalkonium chloride inhibited the growth of *Staph. aureus* but was ineffective against *Esch. coli*, in both types of creams. It was inferred that cold creams do not tend to retard the rate of release of antiseptic.

It was found that 8-hydroxyquinoline sulfate and hexachlorophene incorporated in any type of the selected creams inhibit bacterial growth at the lowest cencentrations: at 0.01 Gm. per cent (0.05 mM per cent), 8-hydroxyquinoline sulfate produced significant inhibition zones on both *Staph. aureus* and *Esch. coli*, hexachlorophene is strikingly more effiective on *Staph. aureus* than on *Esch. coli*.

A potent antiseptic medicament producing equal and effective bacterial inhibition whether incorporated in an o/w base or in a w/o base as determined by the agar cup plate method implies proper diffusion or solution or dispersion in both aqueous and oily phases.

Laboratory Data Sheet

NEWEST DATA
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VITAMIN A ROCHE*
Liquid vitamin A palmitate and acetate
Dry vitamin A acetate powders
Dry vitamin A palmitate beadlets

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Summarized below for your convenience are facts about the many types of Roche vitamin A and vitamin A & D combinations which meet practically all pharmaceutical needs. Samples and technical literature are yours on request — without charge, of course. Ask your Roche salesman or write.

	Type & Name	Usage	Potency (in U.S.P. units per gram)	Additive	Stability	Mesh Size
LIQUID TYPES	**P1MO** **Vitamin A palmitate** *(liquid)*	In tablets, aqueous dispersions, capsulated products	1,000,000	Edible oil only, for standardization	Excellent	—
	P1MO/BH **Vitamin A palmitate** *(liquid)*	as above	1,000,000	Edible oil plus anti-oxidants (butylated hydroxyanisole and butylated hydroxy-toluene).	Excellent	—
	P1.3 **Vitamin A palmitate** *(liquid)*	For oil-free prepara-tions	1,350,000 to 1,450,000	None	Excellent	—
	A1MO **Vitamin A acetate** *(liquid)*	In oil solutions and gelatin capsules	1,000,000	Edible oil only, for standardization	Excellent	—
BEADLETS	**Type 250-S** **Vitamin A palmitate** *Dry Beadlets*	Water dispersible. For dry products which will be reconstituted with fluids, such as dry cereals, etc.	250,000	None	Excellent	Essentially 30-80 free-flowing, for uniform distribution in dry mixes.
	Type 500-S **Vitamin D_2** *Dry Beadlets*		500,000	None	Excellent	
POWDERS	**Type 325A-32.5D** **Vitamin A acetate &** **Vitamin D_2** *(dry)*	For tablets, capsules, vitamin-fortified powdered supplements	A—325,000 D_2—32,500	None	Excellent	40 and 60
	Type 325 **Vitamin A** *(dry)*		325,000	None	Excellent	40 and 60
	Type 500 *(dry)* **Vitamin A acetate**	For dry prepara-tions: tablets, capsules, vitamin-fortified powdered supplements	500,000	None	Excellent	40 and 60
	Type 500A-50D **Vitamin A acetate &** **Vitamin D_2** *(dry)*		A—500,000 D_2—50,000	None	Excellent	40 and 60
SPECIAL	*For research and special production.* Type P1.8/BH (liquid) — vitamin A palmitate; 1.65 to 1.8 million U.S.P. units per gram. Type A2.9 (crystalline) — Vitamin A acetate; 2.8 to 2.9 million U.S.P. units per gram. No oil addition. Antioxidants in Type P1.8/BH: butylated hydroxyanisole and butylated hydroxytoluene. Both types need special handling.			**Packing** All Roche vitamin A is packaged to insure safety in transit and ease of handling in pharmaceutical operations.		

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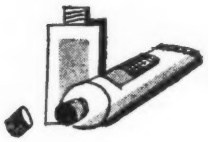

Advancing Therapy

Antivirus Chemotherapy

Although smallpox vaccine has been used for over a hundred and sixty years the disease is still prevalent in many parts of the world, and in 1956 from those countries for which records are available 60,431 cases were reported with 31,622 deaths (52.2 per cent), and the actual number of cases must have been much higher. There is therefore a definite need for a specific antiviral chemotherapeutic agent in the treatment of the disease.

Isatin β-thiosemicarbazone has a pronounced chemotherapeutic effect in mice infected intracerebrally with neurovaccinia virus, and will protect against death after the injection of doses of virus up to 100,000 L.D.$_{50}$ (D. J. Bauer and P. W. Sadler *The Lancet* 1960, I, p. 1110). It has no apparent effect in mice infected intracerebrally with ectromelia virus, but it has a clear chemotherapeutic effect in mice infected with rabbitpox. A considerable number of derivatives of isatin β-thiosemicarbazone have been prepared and tested for antiviral activity, and some have been found to be considerably more active than the parent compound. In view of the activity of compounds of this type against two representatives of the pox virus group it was of interest to see whether they would also have an effect in infections with smallpox virus. N-ethylisatin β-thiosemicarbazone, which was the derivative with the greatest activity against neuro-vaccinia virus, was chosen for this purpose.

Of 80 untreated mice 60 died and 12 developed encephalitis and recovered; whereas of 118 mice treated with N-ethylisatin β-thiosemicarbazone in dose levels ranging from 0.25 to 250 mg. per kg. 10 died and the remaining 108 survived without showing any signs of illness. The dose level which conferred 50 per cent protection against infection was around 0.25 mg. per kg. The compound is of low toxicity; mice will tolerate a subcutaneous injection of 500 mg. per kg. given over a period of five days without showing signs of illness, and the therapeutic index is therefore greater than 2000.

The experiments thus demonstrate that N-ethylisatin β-thiosemicarbazone will protect mice against death and development of apparent illness after intracerebral infection with up to 10^2 L.D.$_{50}$ of alastrim virus, and that protection can be obtained with a dose level as low as 0.25 mg. per kg. An activity of this order is greater than that of the sulphonamides or the tetracyclines against bacteria, and gives reason to expect that N-ethylisatin β-thiosemicarbazone will be of clinical value in treating smallpox in man.

Antifungal Antibiotics

Comparative minimum fungistatic and fungicidal concentrations for 10 fungi have been determined by E. J. Oswald and D. W. Pocurull (*Antibiotics & Chemother.* 10: 285, 1960) with two antifungal antibiotics, tennecetin and candicidin. On a weight basis, the compounds have similar activity, but tennecetin appears to be more fungicidal than candicidin in its action.

For two organisms the fungistatic concentrations of tennecetin were less and for seven organisms more than those of candicidin, while in one case the fungistatic concentration was identical for both antibiotics. Only against *Cryptococcus neoformans* did candicidin exert a fungistatic effect that was considerably superior to that observed with tennecetin. The fungicidal concentrations of tennecetin were less than those of candicidin for five organisms, more than those of candicidin for four organisms, and for one organism the fungicidal concentrations of the two antibiotics were the same. Tennecetin appeared to be more fungicidal in its action than candicidin, since for three organisms the fungistatic and fungicidal concentrations of tennecetin were the same. For five organisms the fungicidal concentrations of tennecetin were twice and for two organisms only four times the fungistatic amount. On the other hand, the fungicidal concentrations of candicidin were the same as the fungistatic concentrations for two organisms, twice the fungistatic concentration for three others, and four times as much for another. Emphasizing a striking difference from tennecetin, the fungicidal concentration of candicidin was eight times the fungistatic amount for one organism, 16 times as much for two others, and more than 16 times as much for another.

Antibiotic PA 155

The prevalence of antibiotic resistant staphylococci at the clinical level has stimulated the search for antibiotics active against antibiotic resistant pathogens. This report by W. S. Marsh, A. L. Garretson, and E. M. Wesel (*Antibiotics and Chemother.* 10: 316, 1960) presents experimental data relating to the origin, discovery, and microbiological study of a *Streptomyces* isolate found to produce antibiotic activity against strains of antibiotic resistant staphylococci.

One microorganism, isolated from an African soil sample and designated BA-3972 in the culture collection, was found to be a strong antagonist to *Staphylococcus aureus* 376, a laboratory strain highly resistant to the tetracyclines, streptomycin, penicillin, and polymyxin. The BA-3972 isolate was recognized as a typical streptomycete and was classified as a strain of *Streptomyces albus*.

Primary in vitro screening against several antibiotic resistant staphylococci showed BA-3972 ultrafiltrate to be active when tested either by agar plate disc or agar streak methods against all of the strains of resistant staphylococci tested.

Chromatographic analyses on *Streptomyces* BA-3972 broth filtrates showed the presence of several active components that were tentatively designated PA 155 A, B, and X.

Preliminary studies by K. V. Rao (*Antibiotics and Chemother.* 10: 312, 1960) showed that the activity due to PA 155 A can be extracted from the broth with solvents such as n-butanol, ethyl acetate, or methyl isobutyl ketone, over a *p*H range of 2.0 to 8.0. Of these, ethyl acetate was selected for the extraction purposes. Concentrated extracts on treatment with excess of heptane deposited the crude antibiotic as a light tan powder.

Concentration of the active fractions gave PA 155 A as a colorless crystalline solid.

Elemental analysis and titration data suggested a molecular formula of $C_{14}H_{15}O_2N_3$ for PA 155 A. The ultraviolet absorption spectrum of the antibiotic showed a strong resemblance to that of tryptophan, thus suggesting the possible presence of indole nucleus in the antibiotic. This was further substantiated by the fact that PA 155 A gave a deep blue color with *p*-dimethylaminobenzaldehyde in strong acid. This color reaction is characteristic of indole derivatives with a free α-position.

PA 155 A is a very weak base, and salts with mineral acids are not stable in aqueous solutions. It cannot also be titrated in aqueous or aqueous alcoholic solutions, but titration in glacial acetic acid with perchloric acid proceeds smoothly and gives a sharp end point with an equivalent weight of 253. It forms a crystalline picrate, the analysis of which shows it to contain two moles of picric acid to one mole of the antibiotic.

PA 155 A is stable to heating for one hour at 100 C. in the *p*H range 2.0 to 8.0 and at room temperature for several days in the *p*H range 1.0 to 8.0. It is easily decomposed in alkaline media.

Antimalarial Sulfone

Substantial antimalarial activity was demonstrated for diamino-diphenyl sulfone by H. M. Archibald and C. M. Ross (*J. Trop. Med. Hyg.* 63: 25, 1960).

The authors have already reported that, in leprous patients, D.D.S. produced not only dramatic improvement of leprosy but also a marked feeling of well-being that might be explained by an effect upon malaria. They report here an investigation of the comparative prevalance of malaria in D.D.S.—treated lepers and in nonleprous people from the same villages. They found that P. malariae parasitemia had disappeared from those taking D.D.S., that P. falciparum trophozoites occurred only about 1/10 as often in the D.D.S. group as in the untreated community, and that parasite densities in the infected individuals on D.D.S. were lower than in those not undergoing treatment. Splenic enlargement in the D.D.S. group seemed to be less pronounced.

The antimalarial activity of a single dose of 200 mg. of D.D.S. was compared in school children with that of 300 mg. of chloroquine base (given as the diphosphate or phosphate). At these doses, D.D.S. had slower action than chloroquine but seemed able to achieve trophozoite clearance.

It is pointed out that doses of D.D.S. up to 800 mg. weekly have been used for years in the Northern Region of Nigeria with very few ill effects. The low cost of D.D.S. would be important in the mass chemoprophylaxis of malaria.

D.D.S. probably acts against malaria by competing with PABA for certain enzymes in the parasite. If it acts on the metabolic processes at a point different from that affected by proguanil or pyrimethamine, it might be effectively used in combination with one of them.

Evaluating Antitussives

Experimental cough induced by citric acid aerosols was used to separate thirteen coded preparations submitted for evaluation into effective and ineffective antitussives by H. A. Bickerman and S. E. Itkin (*Clin. Pharm. Ther.* 1: 180, 1960). The technique yielded objective data in the form of graphic tracings of the cough response which could be subjected to statistical interpretation. Differences in both degree and duration of effect on cough response as measured by changes in the number and intensity of the coughs permitted the grouping of these agents into three general categories.

In group one, insignificant cough suppression was exhibited by three placebos and by compound 9558-U, closely related to methadone. In another group, peak antitussive activity was shown between the first and third hours with waning of effect at the fourth hour. Earlier studies had shown that 15 mg. of codeine behaved in this manner. In this group were included methadone, benzonatrate (Tessalon) and homarylamine (N-methylhomopiperonylamine). Another group showed sustained cough suppression over the four hour period and included morphinolinylethylmorphine (Pholcodeine), dihydrocodeinone resin (Tussionex) and 4964-U (methyldiphenylpiperidine ethanol hydrochloride).

In the over-all assessment of antitussive activity, methadone, morphinolinylethylmorphine, benzonatrate, and homarylamine, 20 and 40 mg. appeared to be equivalent to 15 mg. codeine. Dihydrocodeinone resin and 4964-U, 69 mg., exhibited an effect comparable to that of 15 to 30 mg. of codeine.

Atropine Tannate

M. W. Thomley et al. (*J.A.M.A.* 172: 1634, 1960) reported on the use of long acting atropine tannate in 50 cases of ureteral colic. Patients with that diagnosis on admission were immediately given atropine tannate orally and received it every four hours thereafter. Thirty-nine of 40 patients with ureterolithiasis benefited from the drugs. Thirty-five required no narcotics. The amount and frequency of narcotic required seemed to be markedly reduced in the treated patients.

Lilly Steroid Hormones

M. Perelman et al (*J.A.C.S.* 82: 2403, 1960) of the Lilly Research Laboratories report a new class of active steroid derivatives. These are 19-nor,3-keto derivatives unsaturated in the 4,5 and in the 9,10 positions. The 17β-hydroxy, 17α-ethinyl compound is said to be more effective than 17α-ethinyl-19-nortestosterone in reducing fecundity on rats; exceptionally potent oral anti-estrogens are 17β-hydroxy compounds with CH_3, C_2H_5, or $CH{:}CH_2$.

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Trade Literature

Tablets and Capsules

Nysco Laboratories, Inc., 34-24 Vernon Blvd., Long Island City 6, N. Y., has issued a forty-page catalogue containing its 1960 price list for all its tablets, capsules, capsule imprinting and sealing, gum products, narcotics, powders, vitamins, and specialties.

Uniformly Colored Tablets

Antara Chemicals Division of General Aniline & Film Corporation, 435 Hudson St., New York City 14, has issued a folder describing its tablet binder, Plasdone (pharmaceutical grade PVP), as a color dispersant in medicinal tablet formulations, and outlining general production techniques for tablets with both insoluble and solvent-soluble pigments and dyes.

Psychometric Chart

J. O. Ross Engineering, 730 Third Ave., New York City 17, has made available a new and expanded edition of the Ross Psychometric Chart.

PVP Formulary

A 22-page PVP Formulary, a guide to new and improved products incorporating polyvinylpyrrolidone, has been issued by General Aniline & Film Corporation's Antara Chemicals Division, 435 Hudson St., New York City 14. Booklet No. AP-98, it provides formulations for more than 30 products in considerable detail, giving PVP characteristics as applied to each end-use in the five major categories, and suggesting new applications.

Auger Filling Machines

An eight-page folder fully describing the FMC line of automatic and semi-automatic auger filling machines is available from FMC Packaging Machinery Division, 4900 Summerdale Ave., Philadelphia 24, Penna. Illustrated, it explains the basic principle and advantages of auger filling. A comprehensive chart lists speeds, weight ranges, and container sizes for 11 models, as well as filling methods for each.

Sodium Aluminate

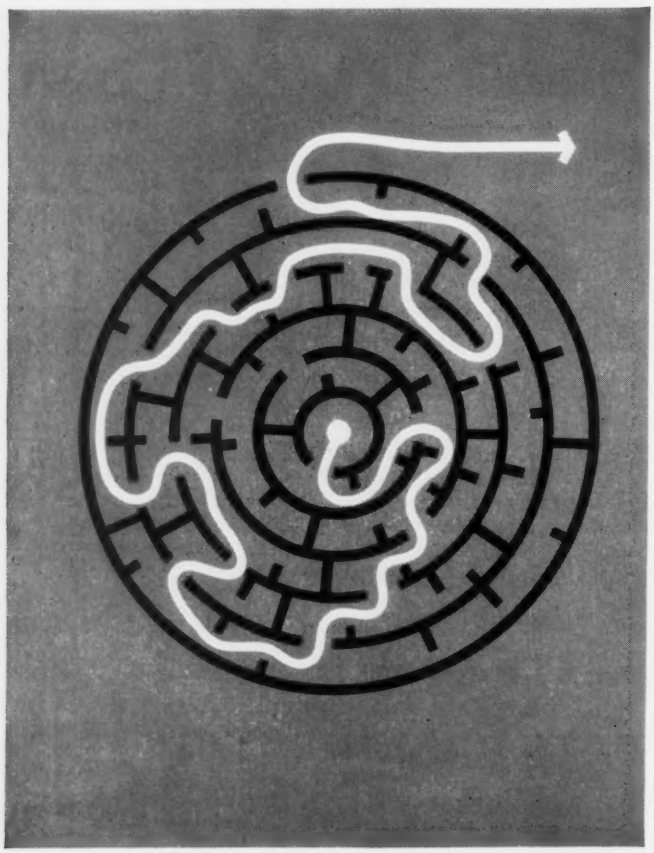
Industrial uses of sodium aluminate are described in a two-color, 12-page brochure available from Nalco Chemical Company, 6216 W. 66th Place, Chicago 38, Ill. Entitled Sodium Aluminates, it outlines the chemical's uses in a wide variety of ways, and describes its physical and chemical characteristics.

Quality Control

Quality Control and Research, a 24-page booklet telling how and why a manufacturer should so insure his product, is available from Scientific Apparatus Makers Association, 20 North Wacker Drive, Chicago 6, Ill. One of a series, it is aimed particularly at the small business man, and is a practical management tool in producing lower-cost, better-quality products.

Cleaning Chemical Equipment

Maintenance Cleaning in the Chemical Industry has been published by Oakite Products, Inc., 19 Rector St., New York City 6. The booklet describes the varied cleaning problems involved and simplifies the diagnosis and treatment.



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Skin Research

Skin Pharmacology

Enzymes, Ground Substance, Melanogenesis, etc.

Braun-Falco assumes that the apparent increase of acid mucopolysaccharides in diseases of the corium may be due to a separating out of these materials from a concealed combination with collagen, the separation being facilitated by various peptidases. *Roe* concludes from her investigations that the isolation of mucins from psoriatic scales indicates a metabolic abnormality in which sulphur is thus lost to the skin. *Weber, Wildner* demonstrated the presence of lactic acid dehydrogenase, which converts lactic to pyruvic acid reversibly, unequivocally in the epidermis. According to *Weber* there appears to be a correlation between the level of lactic acid dehydrogenase in scales and the rate of their formation. *Hurley, Koelle* have, in vivo successfully inhibited plantar skin cholinesterases in man of both the specific and non-specific types by percutaneous absorption of DFP (diisopropylfluorophosphate). This led to no changes in sensation indicating that these cholinesterases play no great role in the mediation of skin sensation. *Griesemer et al.* tested the organophosphorus-anticholesterinase compound sarin for its degree of biologically effective absorption through the skin of the rabbit. The method used compared the effect of intravenous with percutaneous action of known amounts of sarin on the blood cholinesterase. *Steigleder, Elschner* tested esterase activity on the skin in vivo, and it is notable that this activity is not confined to the surface but extends down the follicles up to the sebaceous glands. *Braun-Falco, Theisen* conclude that apart from the action of mitotic poisons in causing alopecia, certain specific enzyme inhibitors acting on stages in the citric acid cycle and on other enzymes may also play a part, as shown by their local effects in the skin of the rat, in inducing temporary hairfall. *Braun-Falco, Theisen* assume that sulphydryl blocking agents may induce alopecia in a way similar to numerous external and internal agents, and the mechanism suggests enzyme disturbance as the primary event in various alopecias. *White* reported that isolated animal melanins are not inert substances, but show many properties in common with cation exchange resins such as some mammalian enzymes and metalloproteins also do. As a cation exchanger and possible absorber of electrons, melanin may have some important influences on ionizing radiation. *Rothberg, Scott* have studied arginase activity in cellular epidermis and different types of horny layers and the factors influencing the assay value are presented. The relation of arginase to parakeratotic nuclei and the arginine content of keratin is discussed. *Stuttgen, Wurdemann* studied extraction, precipitation and separation of endopeptidases in human skin with reference to the methods of assay, from which it was found that increased peptidase activity accompanied acanthosis. *Brinkman, Lamberts* reported that catalytic oxygen transport in the skin in man is partially inhibited by small amounts of ozone in the inspired air. Free radical oxygen apparently brings the slower flavine enzymes into direct use for oxygen transport. *Miller, Goldman* found that certain plant proteases, chiefly papain, will dissolve powdered collagen in the presence of saturated or highly concentrated solutions of urea, thiourea and cysteine. The latter substances inactivate the collagenase of clostridium histolyticum in comparable concentrations. Plant enzymes alone were inactive on the collagen. *Monash, Woessner* showed in contrast to earlier work in which experimental itching was related to protease activity that plant and animal proteases will induce itching after their enzyme activity has been destroyed. *Weber, Theisen* reported that of the two transaminases, glutamic-oxaloacetic and glutamic-pyruvic, the former appears to be produced in the epidermis while the evidence for the latter as opposed to its introduction from the serum is not definitely established. *Stuttgen et al.* studied the inhibitory effects of serum and its components on various skin peptidases. *Weber* found aldolase activity often to be higher in the epidermis and in skin bullae than in the blood.

Sebaceous and Sweat glands

Shelmire has conducted experiments which showed that the spread of sebum on the skin surface took place over aqueous or sweat moistened surfaces without emulsifying the water, or being absorbed into the horny layer. *Ikai* reported that none of the stimuli which commonly increase perspiration affected the delivery of sebum to the skin surface. *Brun, Ritz* noted, using an osmic acid sebum test, a significant reduction in skin surface fat during pregnancy. *Muller, Kireland* described a simpler method of recording sweating after intradermal mecholoyl by using only an iodine tincture and a simple paper imprint of the sweat droplets. *Dobson et al.* noted marked cytological changes in human eccrine sweat glands when they have been forced to secrete for several hours by putting the subject in a heat cabinet. No secretory cycle has been established as yet, and the secretory pattern is more complex than suggested by the simple term "eccrine" as opposed to "apocrine." *Dobson, Lobitz* showed that severe

sweating induces changes that take up to three days to revert to normal, the recovery time varying with the cell type. Interesting metabolic changes are also evidently taking place in the by no means passive sweat duct. *Shackel* showed that lidocaine (xylotox) also has a local depressant action on the responsiveness of the sweat glands (enhanced by adrenalin) as shown by the galvanic skin response. Several mechanisms, including acetyl-choline antagonism, may be at work. *Brun, Domine* simultaneously assessed the intensity of palmar, plantar and axillary sweating in subjects of various ages. The closest correlation was found between palmar and plantar sweating. *Randall et al.* studied the simultaneous recruitment of sweating and perception of warmth in man.

Hormones

Jansen, Rottier gave a description of a motor driven apparatus with which were measured the elasticity and the strength and elongation at the moment of rupture of strips of abdominal skin. The results suggest a hormonal influence on the mechanical properties of skin. In another article they made a comparison of the mechanical properties of strips of human abdominal skin excised from below and from above the umbilicus and found small differences. The values were different from those of *Rolhauser,* probably due to the effect of exsiccation of the strips of skin of the latter, which makes them much more resistant. *Lerner, Case* discussed, after noting the better known effects of diseases and drugs on pigmentation, the influence of the pineal gland compound, melatonin (a 5-hydroxyindole compound), and other agents on the dispersion and dispersion mechanisms of melanocytes. *Hershey* assumes that as reduced phosphopyridine nucleotide is necessary for lipid synthesis, the enzymes producing this substance may possibly bring about increased lipid production by sebaceous glands when they are stimulated by steroid hormones. *Macfarlane et al.* reported that salt retention and oliguria with salt-loss in sweat during heating in man is associated with increased aldosterone activity, but this is not so in animals where there is cooling by panting as opposed to sweating. *Malkinson, Cutukovic* studied the rate and site of metabolic alteration of cortisone and hydrocortisone in the skin with a view to elucidating their differences in clinical effectiveness. The dermis is the apparent site of change and cortisone is most rapidly altered there. *Jarrett* in measuring sebum secretion from test sites by the monomolecular layer method, found that in man the amount was unaffected by progesterone, increased by testosterone and decreased by stilbestrol, findings which were linked to corresponding changes in the activity of acne. *Fukuyama, Baker* reported that various hydrocortisone derivatives given to rats inhibit hair growth in varying degrees, the opposite phenomenon to what happens in man perhaps because of differences in responsiveness of the hair root itself or because of different breakdown products produced.

—*Dermatologica* 119:360, 1960

Topical Triamcinolone Acetonide

The effectiveness of 0.1 per cent triamcinolone acetonide cream was evaluated by simultaneous and symmetrical paired comparisons by V. H. Witten, M. B. Sulzberger, and G. W. Arthur (*Clin. Pharm. and Ther.* 1:294, 1960) with 1 per cent hydrocortisone free alcohol in the same base applied topically by a selected group of patients with dermatoses usually benefited by local corticosteroid therapy. The triamcinolone acetonide 0.1 per cent cream proved to be as effective as the 1 per cent hydrocortisone and sometimes more so. In two other series, a cream containing 0.5 per cent of the acetonide appeared to be superior to the corresponding 0.1 per cent product.

Antibacterial Aluminum Salts

Aluminum acetate solution (U.S.P.) and aluminum chlorhydroxide solution have been shown by I. H. Blank and R. K. Dawes (*A.M.A. Arch. Dermatol.* 81:565, 1960) to have antibacterial activity at concentrations commonly employed for wet dressings. Their antibacterial efficiency is pH-dependent within a fairly narrow range. This pharmacological action is not due to the low pH alone.

Just why these two aluminum salts should not exert their maximum effect at the same pH is not apparent at this time. The amount of aluminum which combines with proteins depends on both pH and the type of anion present. The cation can form various complexes and the specific composition of the cation is known to be a function of the pH. Perhaps these are the factors which affect the ability of an aluminum salt to prevent bacterial multiplication in the presence of cutaneous proteins.

Between pH 4.0 and pH 4.5 the aluminum salts are better buffers than boric acid. Under the conditions described in this paper, aluminum chlorhydroxide, aluminum acetate, and boric acid are good antibacterial agents against micrococci and coliform bacilli, but potassium permanganate is a poor antibacterial agent.

Vitamin A Injection

Intracutaneous injection of normal human skin with an aqueous solution of synthetic vitamin A palmitate containing 50,000 U.S.P. units per cubic centimeter (Keramin) caused hypertrophy of the epidermal cellular layers with a reduction in the thickness of the corneum according to J. V. Klauder (*A.M.A. Arch. Dermatol.* 81:253, 1960). Injection of the same vitamin A solution into various cutaneous lesions gave the following results:

The plantar warts (*including the mosaic type*) of 30 of 31 patients disappeared, usually after a few injections into the wart. *Of warts on the finger* (seven cases) local injection was not uniformly effective.

Keloids (*four cases*) *and scars* (*two cases*) became softer, somewhat less elevated and, in some cases, less tender.

Senile keratoses (*seven cases*) *and calluses* (*two cases*) responded to the injections, while small lesions of *erythematoid benign epitheliomas* (6 cases) retrogressed but subsequently recurred. A lesion of lichen *sclerosus et atrophicus* became softer, smaller, with smoother and less white surface. Of these dermatoses with the possible exception of lichen sclerosus et atrophicus the favorable response is of interest, but this method of treatment is of doubtful superiority to other methods of treatment.

The treatment was ineffective in *keratoses other than senile* (three cases), *leucoplakia* (two cases), *sebaceous warts* (two cases), *chronic lichenified eczema* (one case) and psoriasis (two cases).

Industry's Books . . .

Polyester Resins, *by John R. Lawrence, Production Manager-Plastics, The Glidden Co., 251 pp., Reinhold Publishing Corp., New York, (1960), cloth,* **$5.75.**

This book is a comprehensive presentation of the booming unsaturated polyester resin industry. It covers all aspects from historic background, chemistry, curing mechanisms and manufacturing to techniques used in processing the resins for use in reinforced plastics, casting and coating applications. Uses for the versatile polyesters fall in a broad spectrum from boats to missle bodies, and the author presents them in concise form. Particular emphasis is given to formulating resins for special properties such as weathering and flame resistance. The chapter on coating applications is the most complete coverage ever published on this relatively new use for polyester resins. The appendix includes a tabulation of the basic characteristics of the standard resins manufactured by the major resin suppliers together with related reference material.

The Nature of Science, *by David Greenwood, 95 pages, Philosophical Library (1959), cloth* **$3.75.**

This book is a collection of essays in the general area of logic and mathematics as applied to science. Emphasis throughout is on the linguistic aspects of science and mathematics and should be of particular interest to those concerned with the application of the most recent theories of syntax and semantics to the language of modern science. The essays include "The Nature of Science," "Concept Formation and Operational Definition," "Quantitative Inductive Procedures," "Causality and the Counterfactual Conditional," "The Problem of Real Numbers."

A Modern Herbal, *by Mrs. M. Grieve, F.R.H.S., in two volumes, 888 pages, Illus., Hafner Publishing Co., New York (1959) Cloth, both volumes* **$25.**

This work covers the medicinal, culinary, cosmetic, and economic properties, cultivation and folk-lore of herbs, grasses, fungi, shrubs and trees with all their modern scientific uses. The arrangement is alphabetical, volume I starting with Abscess Root and ending with Hysteronica. Each listing includes synonyms, part used, habitat, description, medicinal action, uses and dosage. Volume II starts with Iceland Moss and concludes with Zedoary. The second volume contains a complete Index. There are more than 160 beautiful illustrations. A very complete work and a valuable addition to our industry's libraries.

Antibiotics Annual—1959, 1960, *1034 pp., Antibiotica, Inc., New York, cloth,* **$15.**

This volume contains the proceedings of the Seventh Annual Symposium On Antibiotics, held November 4, 5, and 6, 1959, at Washington, D. C. Chairman of the Symposium is Henry Welch, Ph.D., and the book is published under the editorial direction of Felix Marti-Ibanez, and sponsored by Antibiotics & Chemotherapy and Antibiotic Medicine & Clinical Therapy. The table of contents of this publication is far too long to be listed here, since it covers some eleven pages. However, among the new antibiotics reported are colistin, aspartocin, fervenulin, streptozotocin, and rifomycin. Needless to say, this latest of the books on Antibiotics is the most complete and comprehensive.

The Story of Chemistry, *by George Lockemann, 277 pages, Philosophical Library (1959), cloth* **$4.75.**

With the rapid development of chemistry, histories of the subject quickly go out of date. This compact volume in the first section covers the period of prehistory, the period of alchemy, the period of iatrochemistry, and independent chemistry to the discovery of oxygen. The second section includes chapters on the development of chemistry from the discovery of oxygen to the mid nineteenth century, development of various branches of chemistry to the beginning of the twentieth century, and a brief survey of the development of chemistry in the first half of the twentieth century. The style is easily readable, the contents of interest to all chemists.

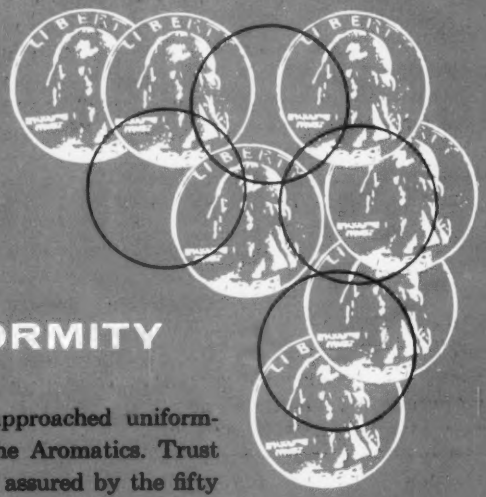
Heterocyclic Chemistry, *by A. R. Katritzky and J. M. Lagowski, 274 pages, Methuen & Co., Ltd., London and John Wiley & Sons, Inc., New York (1960), cloth,* **$4.75.**

Not the least of the virtues of this book is its price, permitting purchase by individuals as well as by libraries. In condensed, clear style, illustrated by almost 2500 structural formulas, the book contains an enormous amount of information on heterocyclic chemistry, all readily accessible because of extensive cross references. Major subdivisions, along with the introduction, are sections devoted to six-membered rings with one hetero-atom and with two or more hetero-atoms; heterocyclic compounds with three, four, seven, or more members; heterocyclic rings containing elements other than nitrogen, oxygen and sulfur; a chapter on physical properties. Within the chapters, the subdivisions cover nomenclature and important compounds, ring syntheses, reactions of the aromatic rings, reactions of substituents on aromatic rings, reactions of non-aromatic compounds.

This work could be a source for any chemist needing otherwise obscure information.

Catalysis Volume VII (Oxidation, Hydration, Dehydration and Cracking Catalysis), *Edited by Paul H. Emmett, Prof. of Chemistry, The John Hopkins University, and 6 contributing authors, 378 pp., Reinhold Publishing Corp., New York, 1960, cloth,* **$13.50.**

This series provides research chemists with a soundly conceived reference source on the physical chemistry of catalysis and catalytic processing. Volume 7 completes the series. It includes four chapters on catalytic oxidation, one on hydration-dehydration and one on cracking catalysts. The first two volumes cover all the general approaches and tools used to gain a better understanding of both homogeneous and heterogeneous catalysis. Volume 3 summarizes existing knowledge on the subjects of hydrogenation and dehydrogenation, and Volume 4 is devoted entirely to the Fischer-Tropsch synthesis. Volume 5 includes hydrogenation, oxosynthesis, hydrocracking, hydrodesulfurization, hydrogen isotope exchange and related catalytic reactions. Volume 6 covers hydrocarbon catalysis.



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(*Continued from page 783*)

tablets are greenish-blue in color, and triangular or "heart shaped." The shape-color combinations of plaintiff's Dexedrine and Dexamyl tablets are arbitrary and non-functional, and when adopted by plaintiff were unique and distinctive and as the result of plaintiff's advertising and promotional efforts, conducted over a period of many years, said combinations of shape and color have come to be accepted and recognized by the medical profession, and the wholesale and retail drug trade, as indicating the products of plaintiff, and as distinguishing plaintiff's, said products from the competitive products of others. Plaintiff's Dexedrine sustained release capsules are colored brown and clear, each capsule containing three groups of small spherical pellets colored three different shades of orange. Plaintiff's Dexamyl capsules are colored green and clear, each capsule containing three groups of small spherical pellets colored white and two different shades of green. Plaintiff's Eskabarb capsules are colored blue and clear, each capsule containing three groups of small spherical pellets colored white and two different shades of blue. Plaintiff's Teldrin capsules are colored bluish-green and clear, each capsule containing three groups of small spherical pellets colored white and two different shades of red. Plaintiff's Edrisal tablets are round and convex in shape and bluish-grey in color. Plaintiff's Trophite is a clear red liquid having a cherry odor. Plaintiff's Troph-Iron is also a clear red liquid having a cherry odor. The colors used by plaintiff for its Dexedrine, Dexamyl, Eskabarb and Teldrin capsules, its Edrisal tablets, and its Trophite and Troph-Iron liquids are also distinctive, arbitrary and non-functional. However, in some instance, drug products of other manufacturers are similar in appearance to said products of plaintiff, although most ethical drug manufacturers, including plaintiff, make a conscientious effort to distinguish their products from the distinctive products of their competitors."

The defendant, according to the court's opinion, has no research or manufacturing facilities and no detail men or salesmen. He purchased drugs from various manufacturers and resold them to retail druggists by mail order. Most of the drugs sold by the defendant were said by the court to be closely imitative, in dosage and appearance, of well-known trademarked drug products sold by large drug manufacturers, including SK&F, and the court felt that the defendant was merely attempting to capitalize on the wide-spread demand for such well-known trademarked products created by the advertising and other promotional activities of their respective sponsors, rather than selling his own goods on their own merits. In this connection, the court stated that Broder deliberately duplicated the shape, colors, and dosages of SK&F's Dexedrine and Dexamyl tablets. Broder, the court further stated, also deliberately duplicated the shape, color, and dosages of SK&F's Dexedrine, Dexamyl, Eskabarb and Teldrin capsules, the shape, color, and dosage of SK&F's Edrisal tablets, and the color, taste, odor, and dosage of SK&F's Trophite and Troph-Iron liquids. Defendant's method of operating, according to the court's opinion, was to offer to sell his alleged imitative products to more than 50,000 retail druggists throughout the U. S. by means of circulars and other forms of advertising in which Broder emphasized the similarities in appearance and dosage between his products and the corresponding trademarked products of SK&F, and actually listed each of the aforementioned trademarks of SK&F in conjunction with Broder's corresponding imitative product. According to the court, the obvious purpose and effect of Broder's advertising was to suggest that the druggist can readily substitute defendant's imitative products in filling physicians' prescriptions calling for SK&F's trademark products.

The court pointed out that substitution by retail druggists of another drug or the product of a manufacturer other than the one called for by the physician's prescription is a known unethical practice in the drug business and is criminal in Texas, as well as in many other states. However, the court noted that substitution is practiced in many instances on account of the financial inducement, inasmuch as the imitative drug usually sells for a fraction of the price which the genuine and well-advertised commands. This was the case here also.

The court realized that it would be an empty victory for SK&F merely to permit Broder to continue marketing the imitative products and merely to require that his bottles or containers be clearly marked as his own and not be sold or dispensed as the product of SK&F. Accordingly, the court enjoined Broder, his agents, servants, employees and attorneys (a) from advertising, offering for sale, selling or dealing in any other way whatsoever with (1) dextro-amphetamine sulfate tablets of generally heart or triangular shape and orange color imitative of plaintiff's Dexedrine tablets; (2) dextro-amphetamine sulfate with amobarbital "tablets of generally heart or triangular shape and bluish-green color imitative of plaintiff's Dexanyl tablets; and/or (3) any other pharmaceutical tablets so similar in therapeutic effect and appearance to plaintiff's said Dexedrine or Dexamyl tablets as to be likely to be confused therewith or to enable retail pharmacists to palm off the product supplied as the product of plaintiff;

"(b) from advertising, offering for sale, selling or dealing in any way whatsoever with (1) dextro-amphetamine sulfate capsules colored brown and clear, imitative of plaintiff's Dexedrine Spansules; dextro-amphetamine sulfate with amobarbital capsules colored green and clear, imitative of plaintiff's Dexamyl Spansules; phenobarbital capsules colored blue and clear, imitative of plaintiff's Eskabarb Spansules; chlorprophenpyridamine maleate capsules col-

(*Continued on page 830*)

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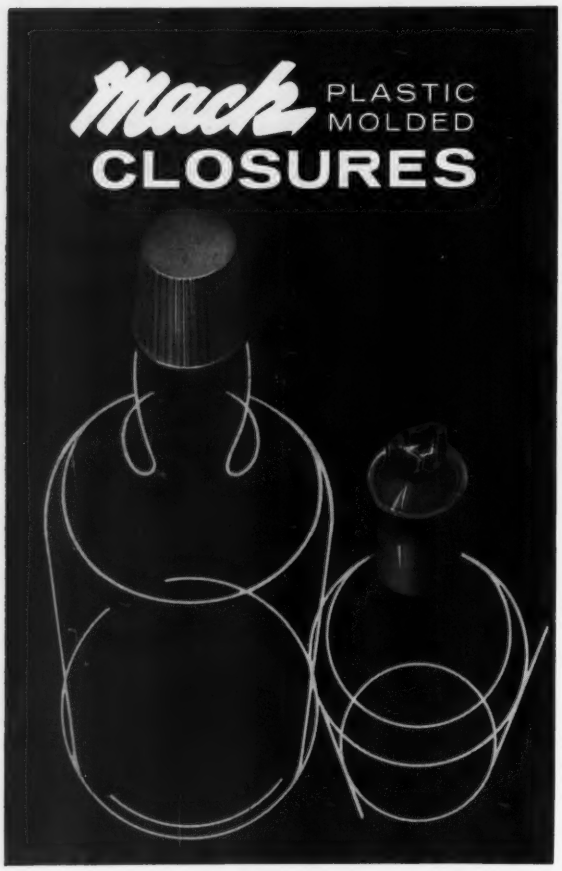

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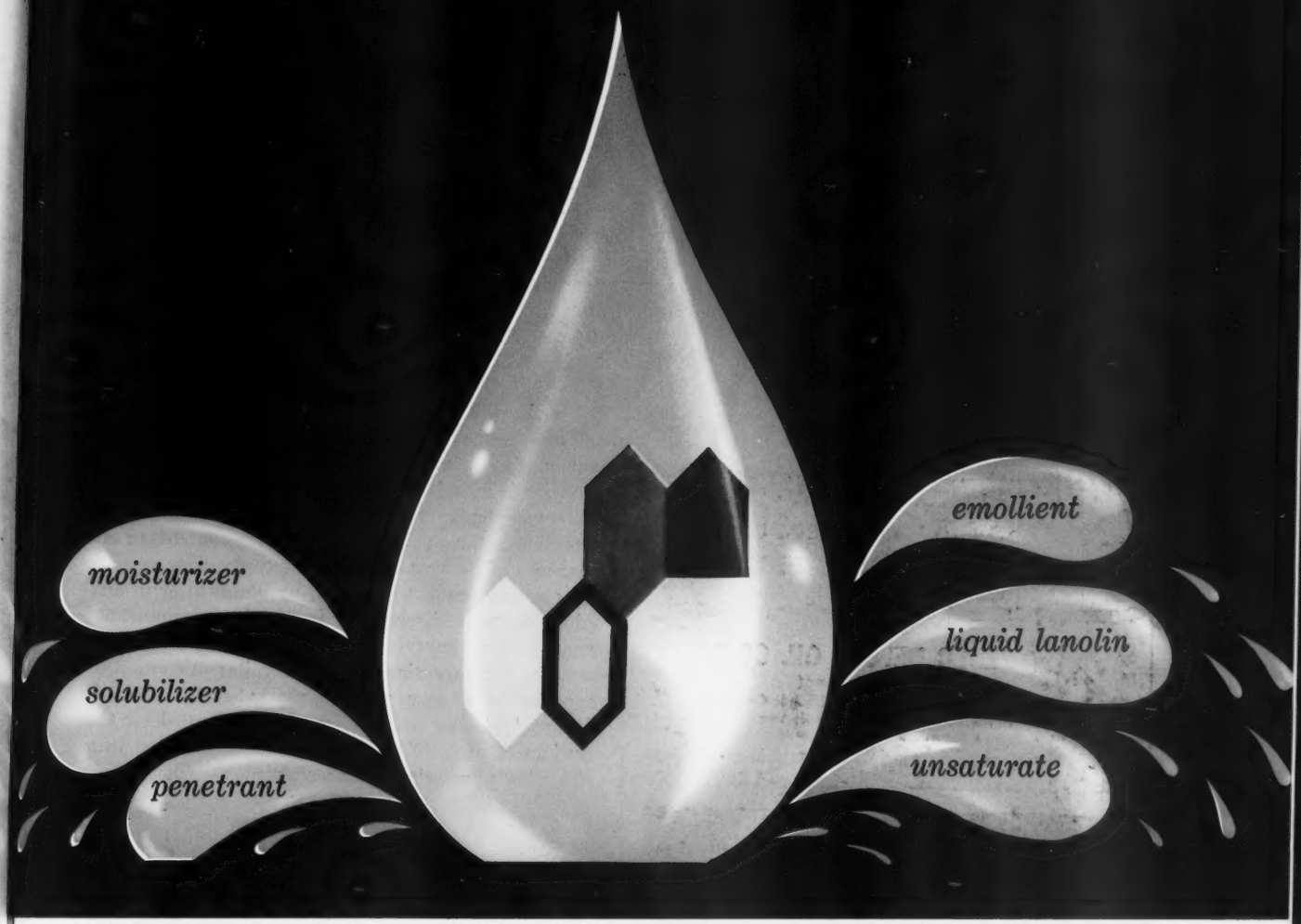
Readers' Questions . . .

Long Duration Injections: *An emulsion preparation of pollen extracts is being used experimentally by a number of allergists to reduce the number of injections required for desensitization. Can you give me any information about this development, and whether its commercial preparation is possible.*
LONG BEACH

This is another aspect of prolonged acting or repository pharmaceuticals, in this case, parenteral preparations. The emulsion under investigation is a water-in-oil emulsion made with mineral oil, Arlacel A, and aqueous pollen extract. The internal phase, the aqueous extract, is 50% by volume of the product and contains various concentrations of active ingredient. Some epinephrine may be included to minimize reactions and to retard absorption further. The fluid emulsion when injected intramuscularly retains its structure and only slowly gives up its aqueous phase by a combination of slow leaching into surrounding tissue and slow removal of the oil. Ideally, one injection may replace months of treatment. The emulsion repository has been advocated and successfully applied by Loveless and by Brown, experimental batches are being prepared by some pharmaceutical manufacturers and a small homogenizer device is being offered to individual allergists to prepare the emulsion aseptically for their own use.

Problems in the manufacture of these preparations include the selection of non-allergenic raw materials, effective emulsification procedure under sterile conditions, and the formulation of a stable emulsion. Since the desensitizing procedure involves the administration of large doses of extracts that are then absorbed only slowly, emulsion breakdown, before injection or in the tissues, would result in the quick absorption of dangerous concentrations of medication. Most rewarding would be investigation of a number of emulsification systems to determine the one giving greatest emulsion stability.



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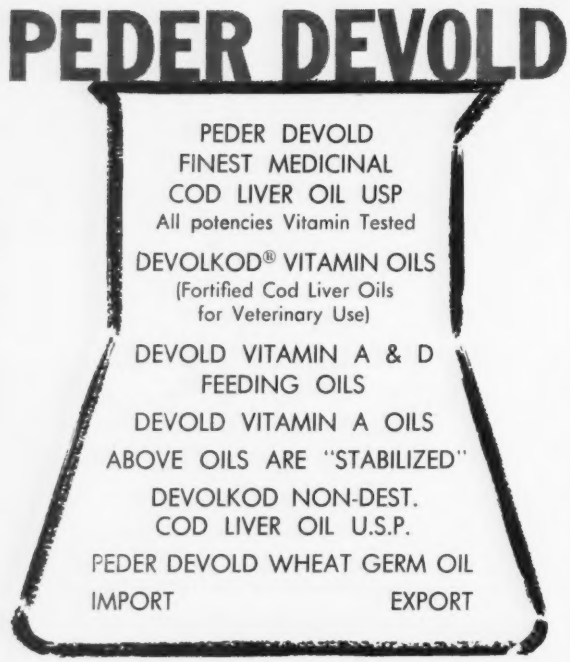

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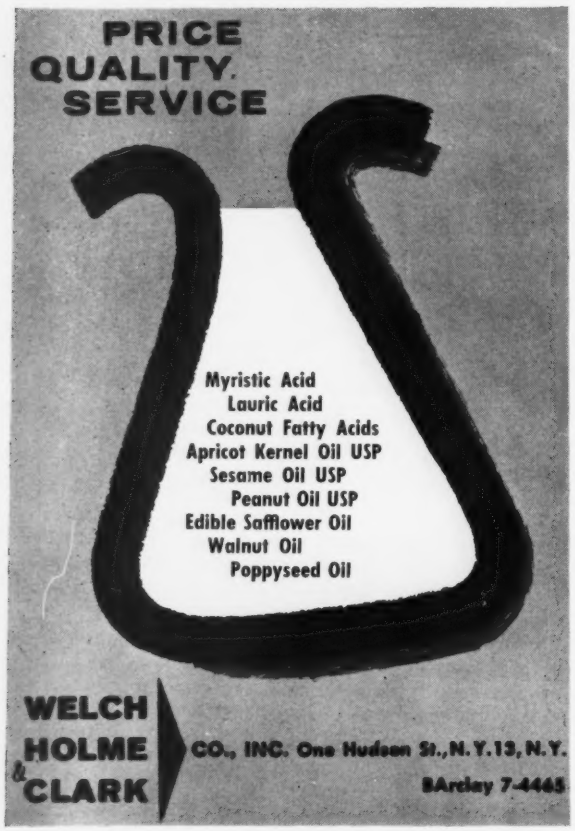


(*Continued from page 826*)

ored blue-green and clear, imitative of plaintiff's Teldrin Spansules; or (2) any other pharmaceutical product so similar in therapeutic effect and appearance to any of plaintiff's said products, Dexedrine, Dexamyl, Eskabarb and/or Teldrin, as to be likely to be confused therewith or to enable retail pharmacists to palm off the product supplied as one of said products of plaintiff;

"(c) from making any reference to or any other use whatsoever, in connection with the advertising, offering for sale or sale of any pharmaceutical product not marketed by plaintiff, of any of the following trademarks owned by plaintiff: Dexedrine, Dexamyl, Eskabarb, Teldrin, Edrisal, Trophite, Troph-Iron, Spansule, or of any other trademark owned by plaintiff and known as plaintiff's trademark by the person making reference thereto or use thereof;

"(d) from advertising or offering for sale any pharmaceutical product in such a manner as to call attention to the similarity between the contents or appearance of such product and the contents or appearance of any product marketed by plaintiff, or in any other manner, directly or indirectly, representing, suggesting or implying to anyone selling or dealing in any pharmaceutical products similar in content or appearance to any product marketed by plaintiff that such similar product may be substituted for the product of plaintiff when the latter is specified in a physician's prescription or a consumer's order."

RECENT PATENTS

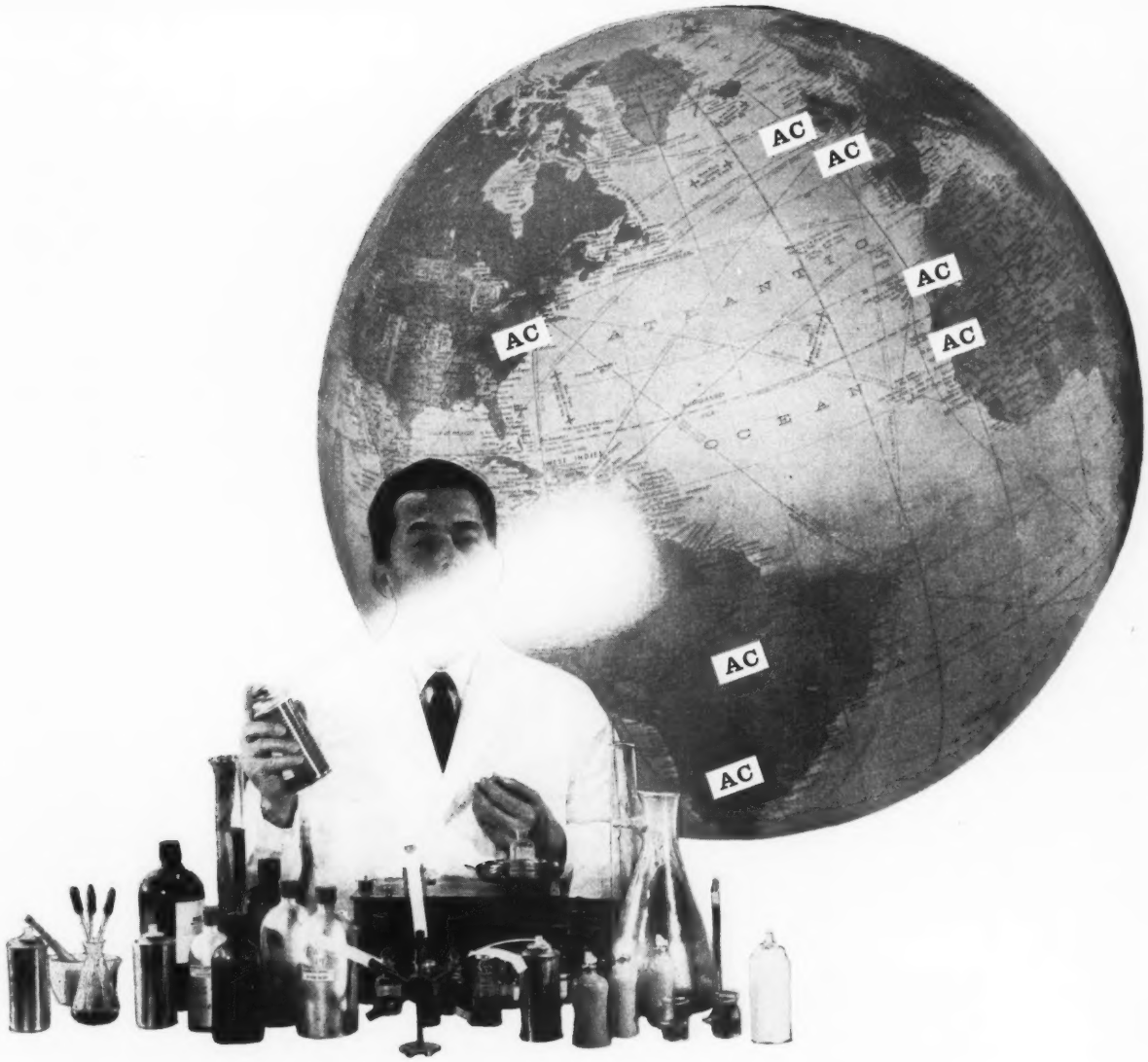
2,928,831—Sterling Drug—Malononitriles
2,928,832—Abbott Labs.—Halogenated Arylalkamine Ethers
2,928,833—S. E. Massengill Co.—Theophyllines
2,928,834—U. S. Vitamin & Pharm Corp.—Methylpiperazine Phenylethyl Benzoates
2,928,835—U. S. Vitamin Corp.—Oxazolidine-Diones
2,928,842—Ortho Pharm.—3-Alkyl Pyrazoles

AEROSOL INHALATION THERAPY

(*Continued from page 810*)

medication. If the medication was sterilized and packaged under aseptic conditions, then sterility would be maintained throughout the life of the product. Through use of a metered valve, the dosage could be controlled so that there would be no danger of either under- or over-medication. Finally, the package design makes it easy and convenient to use by the patient.

There are several ways in which a medicinal can be formulated with liquefied gas to produce an aerosol. If the medicinal is soluble directly in the propellant, a clear solution is produced. When this solution is dispensed from the container, the propellant will vaporize, leaving behind a fine dispersion of the



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medicinal either as liquid or solid particles, depending upon its physical characteristics. Proper choice of propellant, valve, and actuator will produce the proper sized particles. However, most medicinals are not soluble directly in the propellant and may be brought into solution by use of a co-solvent. Considering the number of solvents that are miscible with the propellants and yet are safe to use internally, the problem becomes apparent. Very few solvents fall into this category. Ethyl alcohol has been used in a concentration of about 30 per cent as a co-solvent for some medicinal aerosols. The usual advantages and disadvantages of ethyl alcohol are present. Some other solvents that may be useful but have not been fully tested to date are: polyethylene glycol 200 to 400, methoxy polyethylene glycols, Polyglycols, dipropylene glycol, and hexylene glycol. The toxicity of these compounds must be considered not only when they are given orally but by inhalation as well. Unfortunately very little, if any, work has been done to investigate this phase of aerosol formulation.

Water is a good solvent for many medicinals but, unfortunately, water is not miscible with the propellants. However, it may be possible to formulate a three-phase aerosol using suitable baffles to produce desired particle size. Generally, a three-phase aerosol produces "wet" or "large" size particles, which must be further subdivided before they can be used for inhalation therapy. This type of a system would overcome many of the problems dealing with the toxicity of the co-solvent and the propellant.

For those medicinals which are insoluble, or can be made insoluble in the propellant, a dispersed system aerosol can be used. The powder must be finely subdivided and dispersed throughout the propellant. Suitable dispersing agents are used for this purpose and help to keep the particles in suspension. When the contents are dispensed, the propellant vaporizes, leaving behind the finely subdivided powder, which can then be inhaled. This system overcomes the disadvantages of using ethyl alcohol or other co-solvents in the formulation, but presents the added problem of keeping the suspended particles in dispersion so as to give uniform dosage. This can generally be accomplished by shaking the container prior to use.

To have the lungs retain a reasonable percentage of particles inspired, the particles must remain above a given critical radius, which has been shown to be approximately 0.5 microns. When the medicinals are liquids, the very fine mist of droplets which is formed disappears quite rapidly because of the small size of the droplets. This results in droplets of varying particle size, many of them falling below 0.5 micron. This rapid evaporation is due to the decreased pressure within the respiratory tract, making evaporation more rapid. This is important in the aerosolization of epinephrine salt solutions and other similar substances. The particle size can be stabilized by the

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addition of glycerin, urea, sugar, and some salts. These act by decreasing the vapor pressure of the medicinal solution, thus decreasing their rate of evaporation. With solid medicinals such as penicillin and streptomycin, this is not necessary, as the particles are stabilized and cannot evaporate.

Many medicinal agents lend themselves to administration by inhalation. In fact, any drug given by intravenous injection can, in most cases, be reformulated into a suitable aerosol, provided the drug is capable of being deposited in the respiratory tract and is nonirritating. Such drugs as epinephrine, isoproterenol, octyl nitrite, phenylephrine, and ergotamine have been successfully formulated into liquefied gas aerosols and are used by inhalation. These products have met with a great deal of success and have been readily accepted by both physician and patient. Many other drugs can be applied in a similar manner. Penicillin, streptomycin, and other antibiotics are capable of acting locally or systemically, depending upon conditions. These antibiotics have proved their efficacy when administered with a nebulizer or other suitable means. It may be possible to suspend the finely subdivided antibiotics in the liquefied gas. This would have the added advantage of increased stability, since no water would be present to accelerate decomposition, especially of penicillin. Through the use of a co-solvent, the antibiotic may be brought into solution with a liquefied gas and administered as liquid particles rather than as solids.

Other drugs that may prove more effective when applied as aerosols than when administered by other means may include antihistaminics, antiinfective agents, analgesics, antinauseant drugs, sterols, steroids, antitussive agents, hormones, cardiotonics, diuretics, and many others. Most of these drugs would require further study before they could be used as liquefied gas aerosols. However, once their behavior in the liquefied gases is determined (solubility, stability, toxicity, etc.) they would be readily acceptable as aerosols.

Medicinals administered by inhalation would have many advantages compared to other routes of administration. These would include the following:

1. Medicinals formerly given as an injection can be given by inhalation, thereby making it more convenient for self-medication by the patient rather than by medically trained personnel.

2. Response to drugs when administered by inhalation is prompt, faster in onset of activity as compared to drugs given orally, and with most drugs approaches intravenous therapy in rapidity of action.

3. Since the drugs are absorbed directly into the blood stream via the lungs, there is no decomposition or loss of drug in the gastrointestinal tract, as when the drug is administered orally.

(*Continued on page 836*)

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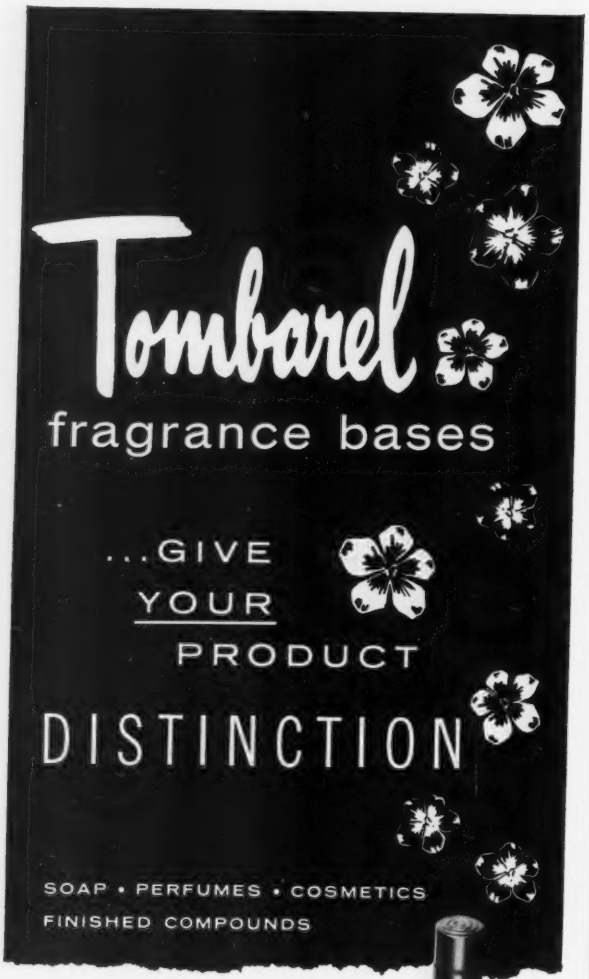

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COMING EVENTS . . . . .

JUNE

12-15 **Extension Services in Pharmacy,** annual national industrial pharmaceutical research conference (stabilization and stability testing of pharmaceuticals), King's Gateway. Land O' Lakes, Wisc. (Richard S. Strommen, E.S.P., Univ. of Wisconsin, Madison, Wisc.)

12-17 **Pharmaceutical Society of the State of New York,** annual convention, Saranac Inn, Upper Saranac Lake, N. Y.

13-15 **Chemical Institute of Canada,** annual conference and exhibition, Ottawa, Canada

13-15 **1960 Microscopy Symposium,** Del Prado Hotel, Chicago, Ill. (Walter C. McCrone Associates, sponsors)

13-17 **Gordon Research Conferences,** lipide metabolism, Kimball Union Academy, Meriden, N. H.

13-17 **American Medical Assn.,** annual meeting, Miami Beach, Fla.

13-17 **Pharmaceutical Advertising Club,** annual P.A.C.-M.P.A.C. joint meeting.

14 **Society of Cosmetic Chemists, Chicago Chapter,** Chicago, Ill. (Lura S. Ricketts, S.C.C., Chicago Chapter, Chicago, Ill.)

16-17 **National Colloid Symposium,** A.C.S. Division of Colloid Chemistry, University Center, Lehigh University, Bethlehem, Penna.

19-22 **American Institute of Chemical Engineers,** Del Prado Hotel, Mexico City, Mexico

20-24 **Gordon Research Conferences,** cell structure and metabolism-secretion, Kimball Union Academy, Meriden, N. H.

24 **Parenteral Drug Assn.,** scientific meeting, Edgewater Beach Hotel, Chicago, Ill. (P.D.A., 1420 Snyder Ave., Phila. 45, Penna.)

27-30 **Toilet Goods Assn.,** annual convention, Poland Springs House, Poland Springs, Maine. (Kathryn Fitzpatrick, Americas Bldg., Rockefeller Center, N. Y. C. 20)

27 **Gordon Research Conferences,** proteins and nucleic acids (through July 1), New Hampshire School, New Hampton, N. H.

28 **Oil Trades Assn. of New York,** golf outing, Siwanoy Country Club, Bronxville, N. Y.

JULY

3-9 **American Assn. Colleges of Pharmacy,** annual convention, College of Pharmacy, University of Colorado, Boulder, Colo.

4-9 **Society of Chemical Industry,** annual general meeting, Bristol, England

11-15 **Gordon Research Conferences,** chemistry, physiology, and structure of bones and teeth, Kimball Union Academy, Meriden, N. H.

19-21 **Western Packaging & Materials Handling Exposition,** Pan Pacific Auditorium, Los Angeles, Calif. (Western Packaging Exposition, Clapp & Poliak, Inc., 341 Madison Ave., N. Y. C. 17)

AUGUST

1-5 **Gordon Research Conferences,** instrumentation, Colby Junior College, New London, N. H.

1-5 **Gordon Research Conferences,** steroids and other natural products, New Hampton School, New Hampton, N. H.

8-12 **Gordon Research Conferences,** food and nutrition, Colby Junior College, New London, N. H.

14-19 **International Congress of Clinical Chemistry,** Edinburgh, Scotland

14-20 **American Pharmaceutical Assn.,** annual convention, Shoreham-Sheraton Park, Washington, D. C.

15-19 **American Veterinary Medical Assn.,** national meeting, Denver, Colo. (Brian M. Foster, A.V.M.A., 600 So. Michigan Ave., Chicago 5, Ill.)

15-19 **Gordon Research Conferences,** medicinal chemistry, Colby Junior College, New London, N. H.

15-19 **Gordon Research Conferences,** analytical chemistry, New Hampton School, New Hampton, N. H.

15-19 **Gordon Research Conferences,** toxicology and safety evaluations, Kimball Union Academy, Meriden, N. H.

15-25 **International Symposium on the Chemistry of Natural Products,** Australian Academy of Science, auspices of the Section of Organic Chemistry, IUPAC, Melbourne, Canberra, and Sydney, Australia

27 **American Hospital Assn.** (through September 1), Civic Auditorium, San Francisco, Calif.

28 **International Pharmaceutical Federation,** general assembly (through September 2), Copenhagen, Denmark

29 **Gordon Research Conferences,** cancer, Colby Junior College, New London, N. H.

SEPTEMBER

1-7 **International Congress on Nutrition,** International Union of Nutrition Scientists, Washington, D. C.

8 **Pharmaceutical Advertising Club,** luncheon meeting, Hotel Roosevelt, N.Y.C. (D. Lindsay, P.A.C., Suite 608, 489 Fifth Ave., N. Y. C.)

11-16 **American Chemical Society,** national meeting, N. Y. C. (A.C.S., National Meetings Dept., 1155 Sixteenth St. N.W., Washington 6, D. C.)

12-14 **Pharmaceutical Manufacturers Assn.,** International Section, The Greenbrier, White Sulphur Springs, W. Va. (Dr. Carl Bambach, P.M.A., 1411 K Street, Washington 5, D. C.)

15-16 **Society of Cosmetic Chemists,** seminar, Hotel Drake, Chicago, Ill. (S.C.C., E. 63rd Street, N. Y. C. 21)

15-18 **Drug Chemical and Allied Trades Assn.,** annual meeting, Sagamore Hotel, Bolton's Landing, N. Y. (Helen L. Booth, D.C.A.T., One Liberty Street, N. Y. C. 3)

18-21 **Federal Wholesale Druggists' Assn.,** annual convention, The Greenbrier, White Sulphur Springs, West Virginia (Ray C. Schlotterer, F.W.D.A., 2 Lexington Ave., N. Y. C. 10)

18-21 **Packaging Machinery Manufacturers' Institute,** annual meeting (P.M.M.T., Room 863, 60 East 42nd Street, N. Y. C. 17)

21 **American Society of Perfumers,** closed meeting (Dorothy A. Douglass, A.S.P., 630 Fifth Ave., N. Y. C. 20)

25-27 **Pharmaceutical Council of Greater New York,** drug and cosmetic show, Trades Show Bldg., N. Y. C.

25-28 **American Institute of Chemical Engineers,** Mayo Hotel, Tulsa, Okla.

26-30 **Instrument Society of America,** annual meeting and instrument-automation conference and exhibit, New York Coliseum, N. Y. C.

OCTOBER

1 **Assn. of Clinical Pathologists,** joint meeting with Assn. of Clinical Biochemists, Royal College of Surgeons, London, England. ●

US

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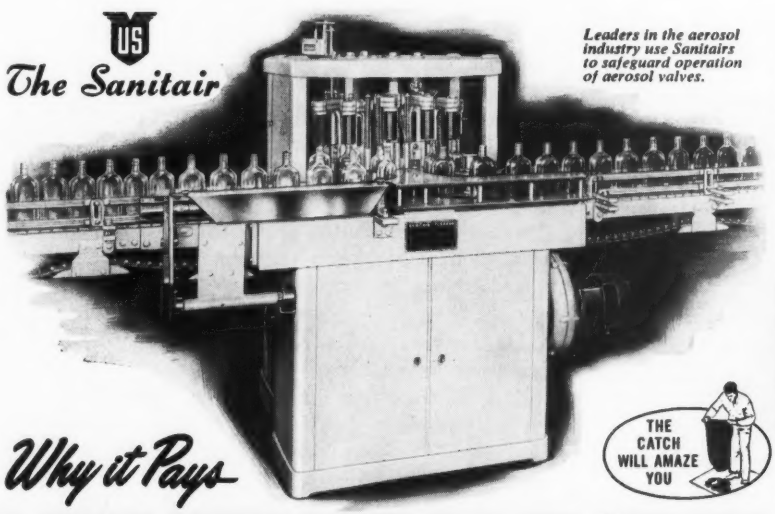

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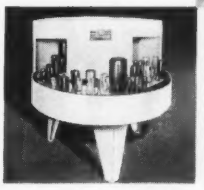

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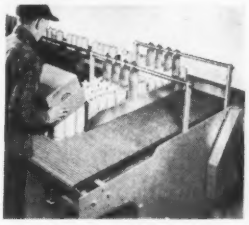

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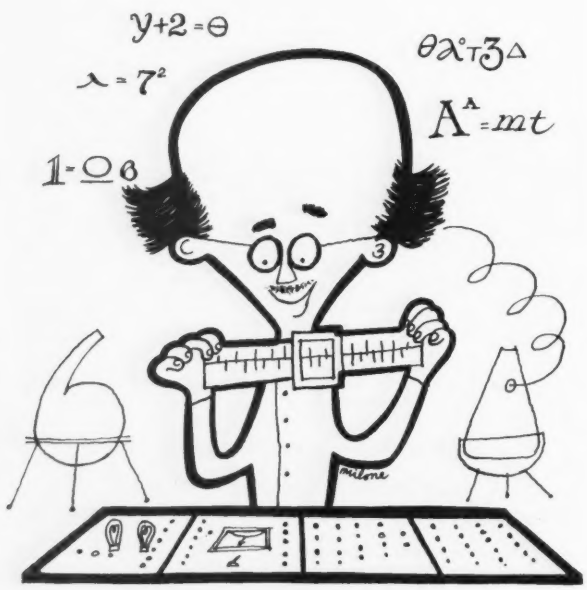

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(Continued from page 833)

4. The dangers of giving medicinals by injection (trauma, embolism, sterile abscesses, etc.) are avoided since inhalation therapy will often replace an injectable product.

5. The use of medicinals by inhalation does away with the necessity for elaborate sterile preparations necessary for parenteral administration.

REFERENCES

1. Best, C. H. and N. B. Taylor. 1955. The Physiological Bases of Medical Practice. Sixth Edition, The Williams and Wilkins Company, Baltimore, Md.
2. Dautrebande, L. 1952. Physiology and pharmacology of aerosols. Physiol. Rev. **32**: 214-75.
3. Glasser, Otto. 1950. Medical Physics Volume II, (Respiratory System—Harold A. Abramson), The Year Book Publishers, Inc., New York. : 823-34.
4. Porush, Irving, Charles Thiel, and James Young. 1960. Pressurized aerosols for inhalation therapy. I. physical testing methods." J. Am. Pharm. Assoc. Sci. Ed. **49**: 70-72.
5. Sciarra, John J. 1956. Aerosol therapy. Aerosol Age **1** (No. 5): 14-17.
6. Young, James, Irving Porush, Charles Thiel, et al. 1960. Pressurized aerosols for inhalation therapy, II. analytical control methods. J. Am. Pharm. Assoc., Sci. Ed. **49**: 72-74.

SCC MIDYEAR MEETING

(Continued from page 755)

ethanol, water, isopropyl palmitate, mineral oil, and in the presence of humectants and surfactants, as well as in the presence of sebum and sweat constituents, the U.V. absorption spectra of several para-amino benzoate derivatives were particularly affected, while other types were modified to a lesser extent.

Herman Bogaty, in his paper "Molecular Forces in Permanent Waving," emphasized the part played by secondary keratin bonds in the waving process. Agents that promote hydrogen bond rupture can enhance the waving action of mercaptans or may even wave in the absence of reducing agents. Salts increase hydrogen bonding in hair and may thus depress the waving activity of mercaptans. The stabilization of curls produced by the waving of reduced hair can take place without reoxidation of the disulfide cross links by allowing time for the reformation of hydrogen-bonded cross links. Thus, reduced keratin behaves like many synthetic fibers that can set even without covalent cross links.

Dr. Herbert C. Stecker and Dr. Richard E. Faust presented, in "A New Antiseptic Brominated Salicylanilide Composition for Soaps and Cosmetics," data on a synergistic combination of dibromo- and tribromosalicylanilide with a number of advantages as an antimicrobial for soaps and cosmetic formulations. Studies indicate the effectiveness of the mixture at levels of 0.3 to 0.5 per cent in soaps and at considerably lower levels in cosmetic products. Several types of cosmetic formulas were presented to illustrate effective antiseptic levels, and tests showed compatibility with cosmetic ingredients, including many surfactants. Extensive data have been accumulated concerning chemical and physical properties, toxicity, and pharmacology.

Robert James and Robert L. Goldemberg, in "The Use of Ternary Diagrams in Cosmetic Formulation,"

advocated a technique to permit the acquisition of significant research results with minimum wasted effort. Combining crossed and parallel series of experiments with ternary diagrams to record data, reduced the number of samples required to obtain desired information. Information is thus condensed into less space, to provide a clear picture of the system under investigation.

AMERICAN SOCIETY OF PERFUMERS

(Continued from page 757)

individuals are brought about by factors other than environment. Temperament could be predetermined in terms of physical structure, according to the beliefs of William H. Sheldon, and this temperamental makeup could assist in selecting those temperamentally disposed to provide meaningful answers to the problem of odor selection.

Dr. Oliver L. Marton discussed "Pitfalls in Perfumery." These can be classified in three categories: lack of knowledge of perfumery; negligence or inaccuracy; and unknown causes. Among natural pitfalls are sensitivity to light, heat, and air and the physico-chemical properties of cosmetics and packaging materials. Human factors are the delegation of perfumery decisions to nonperfumers, wrong interpretation of literature and test data, and biased testing.

Thomas Cifelli, Jr., in "Perfumes and Patents," pointed out that the U. S. perfumer may disregard patents only at the risk of reducing profits and inviting trouble. Extension of perfumery into industrial products has increased the risk of patent infringement.

Walter Lengsfelder, in "The Abstract Concept of Perfumery," pointed out that abstract thinking has always accompanied artistic endeavor and draws a parallel for perfumery. From descriptive floral perfumes to modern perfume creations, there is a definite development toward the abstract. Perfumers should not be afraid to move away from natural fragrances, since there is always some connection with natural effects.

BERGAMOT OIL

(Continued from page 759)

values are directly proportional to concentration. (Figure 2 shows the U.V. spectra of pure bergamot vs. adulterated bergamot.) This method allows us to estimate the amount of pure bergamot oil in a sample. The fixed oil, or residue, on evaporation test in the N. F. is usually a good confirmation of such dilution, but a clever sophisticater can build up the residue by adding nonvolatile oils or waxes. The U.V. characteristics are not so easily adjusted, and therefore offer a simple, rapid quality check.

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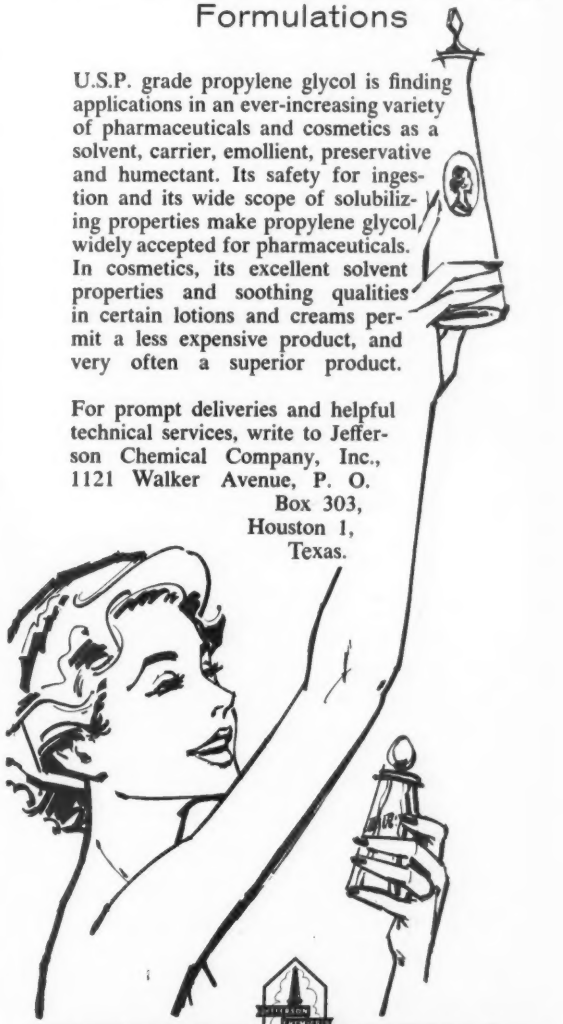

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Infra-red spectra provide a wealth of information (Figure 3). We have paid particular attention to the absorbance ratio betwen the bands at 12.00 μ and 12.52 μ. Terpenes of the type $CR^1\ R^2\ CHR^3$ absorb at 12.52 μ while linalyl acetate absorbs at both 12.52 μ and 12.00 μ. Thus, if the 12.52 μ absorbance increases without a proportional increase in the 12.00 μ band, we suspect adulteration with terpenes. Incidentally, terpenes are considered excellent additives, since they are cheap, plentiful, and help keep the oil within the N. F. requirements for optical rotation.

Our study indicated that a normal 12.00 μ to 12.52 μ ratio for natural bergamot oil falls betwen 0.9 and 1.14. Ratios significantly below the 0.9 figure indicate possible contamination with terpenes (Figure 4). In all cases where low ratios were found, vapor phase chromatography confirmed an abnormally high terpene content.

The separation of all or most of the volatiles in the oil by gas chromatography offers the additional advantage of indentification of extraneous materials.

The chromatograms were run with a Perkin-Elmer Model 154 Vapor Practometer having a 12-foot carbowax 1540 column at 175° C. and 25 p.s.i. gauge helium pressure.

Actual amounts of the components in the various samples were not calculated but, rather, we used the simple "percentage area measurement" method. Area percentages are not absolute composition values, but they do allow direct comparisons between materials. We found that the main natural components present in pure bergamot oil fall within those ranges shown in Figure 5. We are not concerned with the minor constituents which are present in trace amounts.

The alpha-pinene and di-limonene ratios are more critical, since adulterated oils frequently fall within the limits for linalool and linalyl acetate.

By observing the changes in the relative pinene-limonene values we have detected the addition of lemon oil terpenes together with linalool and linalyl acetate from other sources. The alpha-pinene values are lowered or the limonene values increased (Figure 6). Incidentally, this type of dilution usually does not alter the infra-red absorption ratio limits stated before. If the linalool is omitted this is, of course, immediately apparent on the chromatogram.

When materials not naturally present in bergamot oil are added, they appear as new peaks on the chromatogram, as shown in Figure 7. Normally it is not necessary to identify such ingredients, as their appearance is sufficient evidence of adulteration. However, we have identified through infra-red and vapor-phase chromatographic technique such contaminants as methyl carbitol and p-cymene.

Recently, samples of African bergamot oil have been received, and it is very easy to differentiate between these and the Italian material. The U.V. ab-

sorption maximum occurs at approximately 298 mμ instead of approximately 313 mμ (Figure 8). Aside from this shift we have found little difference in the other analytical specifications.

We have selected two examples to illustrate the value of our analytical scheme. As shown in Figure 9, they both were acceptable according to N. F.

FIGURE 9
Bergamot Oil—N.F. Analysis
Comparison of Samples X and Y

Item	Sample X	Sample Y	Specification
Refractive index @20° C.	1.4668	1.4673	1.4650—1.4675
Optical rotation	+19°	+20°	+8° to +24°
Fixed oil	5.28%	3.13%	Less than 6%
Linalyl acetate	38.6%	39.1%	More than 36%

specifications, although sample Y had a slightly lower fixed oil content than we normally expect. We then put these samples through our additional testing program. The results are shown in Figure 10. The low U.V. extinction values correspond to about 50 per cent natural bergamot. The low alpha-pinene value for sample X compared to normal values for limonene, linalool, and linalyl acetate indicates that this oil was sophisticated with a carefully selected blend of lemon oil terpenes (mainly limonene), linalool, and linalyl acetate. Note that in this sample the infra-red spectrum did not provide us with sufficient data to detect this type of adulteration.

The I. R. data indicated that sample Y was modified by the addition of terpenes. Probably some

FIGURE 10
Bergamot Oil—Additional Instrumental Analysis
Comparison of Samples X and Y

Test	Sample X	Sample Y	Expected Range
E $\frac{1\%}{1\ CU}$ 312.5 mμ	6.13	5.65	10-13
I.R. Ratio $\frac{12.00}{12.52}$ μ	1.01	0.74	0.9-1.14
Vapor Phase Chromatography Area Percentages			
Alpha pinene	2.1	5.7	7-10
d-Limonene	40.4	37.6	38-46
Linalool	24.1	10.1	17-24
Linalyl acetate	27.3	25.2	22-32
Unknown alcoholic contaminant	——	9.9	None

linalyl acetate was also added to maintain the ester content as per N. F. requirements.

Gas chromatography confirmed this assumption, as shown by the lowered alpha-pinene and linalool figures.

In addition, an alcoholic contaminant was present in appreciable amount. This was later identified as methyl carbitol.

In conclusion, the correlation and interpretation of analytical data obtained by the use of modern instrumental methods as presented here provides an accurate and rapid means for detecting additions to natural bergamot oil. It provides the perfumer and purchasing agent with additional information to help judge the qualities of variously priced oils. It elimi-

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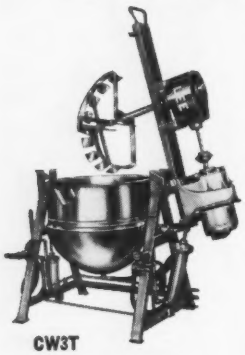

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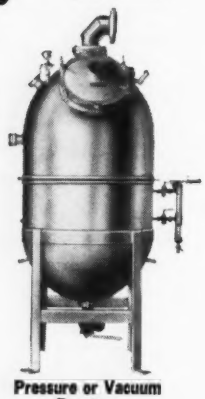
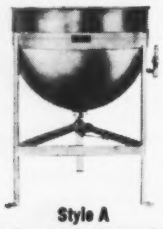
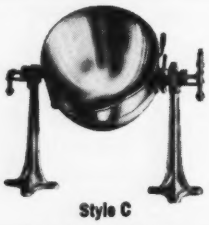


Pressure or Vacuum Reactors
to 500 gal.



Style A
Two-thirds Jacketed
2 to 1500 gal.



Style C
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2 to 100 gal.

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nates, to a great degree, tedious and complicated wet chemical methods of analysis.

We hope that the use of the correlations shown here will be of value to everyone concerned—importers, sellers, perfumers, and consumers—to maintain uniformity of their supplies and obtain the best quality oil at a fair price.

REFERENCES
1. National Formulary, 10th Edition.
2. Maurel, A. and M. Bassiere. 1951. Annal. Fals. et Fraudes **44**: 22-28.
3. Preswell, A. K. 1953. J. Soc. Cos. Chem. IV (2): 101.
4. Guenther, E. 1949. The Essential Oils. D. Van Nostrand Company, Inc. Vol. III. : 268-271.

PHARMACEUTICAL AEROSOLS

(*Continued from page 747*)

3. Aerosol application avoids the spread of infection while applying medication. If a local infection is being treated in the ordinary way, the infection can be spread while spreading the medication.

4. Application of pharmaceuticals by aerosol avoids the pain sometimes associated with spreading of salves by use of spatulas, etc. The aerosol product can be sprayed directly on the area with no necessity of further spreading. This would be especially true for such things as burn victims and those with sensitive dermatitis.

5. More uniform coverage of the affected area is achieved by use of aerosols. This also has another advantage in that less product can generally be used with aerosols. There is no excess product left on the spatula or wasted by spreading to excess on the skin.

6. Topical dressings applied in the aerosol manner are not only faster, but easier to use. This is especially advantageous for children, and also when speed of application is of primary importance.

7. There is very little danger of accidental poisoning by ingestion when the material is contained in an aerosol can. Generally, the bad taste of poisonous material while being sprayed in the mouth and the length of time necessary for a spray to deliver a lethal dose would cause any person being so foolish to stop before much harm could be done. A child would hardly stand with his finger on an aerosol button spraying a poisonous material into his mouth. He might, however, pick up a bottle of poisonous material and gulp down enough to do damage before the bad taste could stop him from doing this.

8. The ability of an aerosol to deliver a properly metered dose of inhaled aerosol product shows a definite advantage over vaporizers or nebulizers.

9. Powders and products incompatible with water may be administered as an air suspension for inhalation from an aerosol can.

10. More uniform particle size can be obtained by the use of aerosols than by most conventional means. This permits more rapid action in using inhaled products.

11. Because relatively uniform small particles can

be inhaled by the use of an aerosol, a large portion of the systemic materials normally administered by injection are open to aerosol application. Advantages for the use of aerosol in administering systemic drugs would include such things as: (a) elmination of the need for injections and the amount of sterile equipment associated with them; (b) the fact that action of drugs applied by inhalation aerosols is theoretically as rapid as when applied by injection; and (c) that drugs normally taken orally will take effect much more rapidly when inhaled.

In addition to these technical advantages, aerosols and pharmaceuticals share a mutual advantage. The cost of aerosol packaging is generally low in comparison with the cost of most pharmaceutical products; therefore, they can easily absorb the additional cost of aerosol packaging without fear of losing customer acceptance. Economy of use, or advantages gained by this method of medication will easily outweigh the aerosol packaging costs.

Many conditions requiring medication lend themselves readily to aerosol treatment. Virtually all types of topical applications are potential products for aerosol application.

Burn remedies are among the most familiar aerosol pharmaceutical products on the market. These products have already gained consumer acceptance, not only at the retail level, but in hospital studies. The recent use of aerosol burn remedies in the Harlem tenement fire has shown that aerosol application of burn medications appears to be superior to conventional means. Currently, about $10.5 million worth of burn remedies are sold annually.

All types of dermatitis can be more readily treated by aerosol application. In addition to prescription items sold, there are currently about $20 million worth of acne aid products and $4 million worth of athlete's foot medications sold per year. Poison ivy remedies, exclusive of calamine lotion, represent a $10 million industry. In addition, a portion of the $38 million external antiseptic field is for the treatment of dermatitis. Various antibiotic and anesthetic products are also used for topical applications for dermatitis, as well as are various hormones. For the prevention of dermatitis conditions in babies, such as diaper rash, aerosol sprays can be used effectively and immediately upon recognizing the outbreak of these conditions. The product can be sprayed directly upon the skin, or, if skin chilling is to be avoided, it can be sprayed on the diapers, thereby sanitizing them and using them to apply the medication.

For cuts and abrasions, various aerosol antiseptic and anesthetic products have appeared on the market. If it is desirable to avoid spraying of these products, for instance, around the face, or where the product might contain a dye, a fast-breaking foam can be applied directly to the wound. These foams quickly break upon application to the skin, or when a dressing is applied over them, leaving the active medication in contact with the area. They could also

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be applied directly to the dressing if such a method is desirable. The remainder of the $38 million-external-antiseptic market (excluding dermatitis treatment) is for cuts and abrasions.

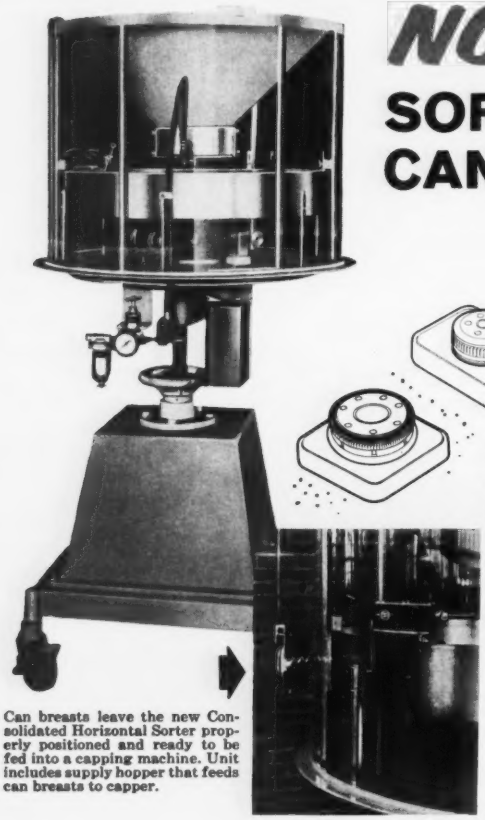
The use of aerosols for applying external analgesics might eliminate the need for the messy rubbing-in of these products when used. Excluding rubbing alcohol, a $63 million market exists for this type of product.

Eye lotions and washes, and particularly eye medications, could readily be applied by the aerosol principle. For applying medication to a patient's eyes an oculist would probably welcome an aerosol spray with a metered valve which could deliver a measured dose of sterile medication directly on the eye without the necessity of applying drops. Such applications would be quick and easy, and probably would assure more uniform application of the medication. Packaged eye lotions and washes are currently selling at the rate of about $6 million per year.

Doctors also would probably be enthusiastic over a quick and easy method for applying ear medications. A convenient, low-pressure medicated spray for the ear would assure uniform application without drenching the inside of the ear, which decreases the hearing capacity of the patient.

In the operating room, the doctor might find an aerosol antibiotic spray convenient and effective for application on incisions. Currently, antibiotic powders are dusted in open incisions prior to suturing to avoid infection. It may even be within the realm of possibility that clear plastic sprays can be used not only to avoid the necessity for suturing, but also to serve as its own dressing. If small incisions are held together and sprayed, they will remain together without suturing. The avoidance of suturing represents not only one less area as a possible seat of infection, but also has aesthetic advantages. Moreover, if infection does develop, the doctor can see through the spray bandage and detect it in its earliest stages. Plastic surgeons may some day find this principle of inestimable value. Larger incisions might be kept closed by using a spray, a layer of gauze, and another spray to entrap the gauze.

The use of these plastic resin sprays has found application in spray bandages outside the operating room. These can be used, not only for small cuts and scratches as might be encountered around the house, but also in hospitals, when large areas must be covered. These spray bandages can be of the type which will remain on the skin until peeled off, or they may be of the type that can be easily washed off when desired. Hospitals are finding them valuable in treating large open sores such as bed sores, since they not only protect the area and promote healing, but they also cut down on the time required for dressing. Fewer dressings are required and there is less chance of bed linen being soiled by con-



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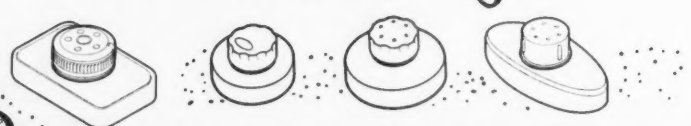

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tact with sores of this type. There are currently about $59 million worth of adhesive bandages and compresses sold, in addition to about $3 million worth of gauze, bandages, and dressings.

Another area suitable to aerosol application of drugs and pharmaceuticals would be that of vaginal products. A foam product, equipped with a metered valve and an adapter similar to that found on a feminine bulb syringe, could be used for any vaginal purpose such as common hygiene, therapy, or for germ-killing purposes. Such a foam product could easily be applied in the proper doses without much chance for customer misuse. The use of a foam product would insure almost complete penetration to all parts of the vaginal cavity. Feminine hygiene medications and vaginal jellies and creams currently represent a $45 million market.

Apart from topical aerosols, a separate field exists in the area of treatment of various portions of the respiratory tract. This group might include treatment of any area from the nasal passages down to the lower portions of the lung. Foremost in this area is the application of the aerosol idea to the treatment of bronchial asthma. Inhalation of air-borne particles has long been a method of treating asthma. Aerosol products represent the advantage that a metered dose of a more uniform particle size can be delivered. It has been estimated that a $6 million market exists for aerosols for the inhalation treatment of asthma. Other uses include aerosols for nasal sprays, again utilizing these same advantages. A market somewhere in excess of $42 million exists for nose drops, nasal sprays, and inhalants. Mucolytic agents for use in solubilizing mucous in the lungs can be incorporated in aerosol inhalant sprays. Hospitals will probably find advantages in aerosol inhalation application for treating such diseases as tuberculosis, pneumonia, and pleurisy.

A modification of respiratory inhalation medications can be seen in the current marketing of room vaporizers. For this, the medication is suspended in the air by the use of a room deodorant type of aerosol. These particles are inhaled by the patient in the room, and medication is thus absorbed. Vaporizing aerosols are useful only where humidity is not required to assist in the medication.

A third aerosol pharmaceutical application, apart from topical sprays and respiratory inhalation products, is the area of inhalation of systemic medications. Virtually any systemic drug innocuous to the lung tissue may be administered in this way, when formulation problems are solved. It represents a tremendous advance in medication, eliminating the need for injection of many materials. Many drugs, such as insulin, cannot be taken orally because of the effects of the digestive system upon the drugs themselves. The idea of rapid-acting, painless administration of drugs holds wide appeal to the medical profession. Everything from aspirin and seasickness

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medication to insulin and cardio-tonic drugs could be administered in a readily acceptable fashion. There would be no need for the delay in the action of products such as aspirin or motion-sickness tablets, nor would there be need for injection of products such as insulin and medication for ulcers. Until now, there has been virtually no successful method for insuring proper home dosages of medications with particles fine enough to be absorbed through the lung tissue.

Aspirin alone represents approximately a $66 million market per year, while motion sickness preparations represent approximately $12 million per year. It is estimated by the American Diabetes Association that there are approximately two million diabetics in the United States. Of these, only one million are aware of the fact that they have diabetes and half of these, or five hundred thousand, are currently using insulin injections daily, in some cases, two or more injections a day.

Straight fluorinated hydrocarbon propellants have found application so far in assisting in skin planing. The propellant not only freezes the skin and makes it hard, but also anesthetizes the skin so that the planing may be undertaken.

Currently, approximately $70 million is spent per year on cough syrups, elixirs, and expectorants. Such products can easily and conveniently be packaged in pressurized containers, which would be extremely convenient and sanitary for use, especially when combined with a metered valve to deliver exactly the required dosage.

Other areas that border on the pharmaceutical aspect of aerosols could include such things as air sanitizers and sterilants. If a truly effective aerosol air sanitizer could be developed, it would make the hospitals' jobs easier in sanitizing hospital rooms used by patients with communicable diseases. Currently, only scrubbing and soaking in various strong solutions can accomplish this result. The spraying of hospital furniture and matresses could easily be done by the aerosol method.

One of the biggest current headaches of hospitals is the growth of the staphyloccus infections which have caused so much trouble. Most hospitals are currently on an extensive disinfecting and cleaning campaign to rid themselves of hospital staph. The development of a staph-killing aerosol for use in hard-to-reach areas behind radiators, where pipes come through the floors, or in other inaccessible places, would probably be a great aid. Economy-minded hospitals would undoubtedly welcome a large aerosol container that could be refilled by themselves or refilled by a custom filler.

We can see, from the preceding aerosol products and their counterpart nonaerosol products, that there is a tremendous future market for medicinal and pharmaceutical aerosols. The nonaerosol figures cited add up to about $450 million, and for many areas no logical estimates can be made. It is virtually im-

possible to estimate the value of insulin consumed, or antibiotics used in surgery. It has also been mentioned that aerosol pharmaceuticals have not grown as other aerosol products have grown. However, behind the phenomenal growth of each of these other aerosol products has been a concentrated promotional effort on the part of the marketer. Such promotional effort has not been made by the marketers of aerosol drugs and pharmaceuticals. The first that do will reap increased sales benefits as did the big promotional people in the other aerosol product groups. An easy illustration of this can be seen by looking at a few growth curves for other aerosol products. In most cases aerosol products grow slowly at first; they first sell simply because of the convenience and novelty of the aerosol idea. The aerosol idea is a good idea and will sell itself to a certain extent. This is basically why today's aerosol drug and pharmaceutical market has grown to its present size.

The growth curve of the entire aerosol industry is a fairly typical example of this slow, then fast growth. The industry grew slowly until 1951 and the introduction of such products as room deodorants and hair sprays. The marketers of these products, particularly hair sprays, are active marketers; they began big advertising campaigns which caused the industry as a whole to go up. Household insecticides also hit their breaking point in 1951, although not as dramatically as did the entire aerosol industry. Room deodorants, after a relatively slow start, increased slightly in 1951, but more so in 1954 when their concerted advertising campaign was undertaken. Hair sprays began their extensive marketing campaign almost at their inception in 1952. Colognes and perfumes were extremely slow to enter the field and, therefore, their entry in 1953 begins their concerted marketing campaign, which was again intensified in 1956. The classic example of aerosol growth would be in the field of aerosol coatings where the idea sold itself for a matter of close to five years, with declining sales between 1953 and 1955. In 1955 when marketing campaigns were undertaken, the industry skyrocketed almost unbelievably.

Today, the pharmaceutical aerosol industry is at the point where sales can either continue at their present relatively leisurely growth rate, or they can be helped up to tremendous heights. We have seen that, currently, aerosol pharmaceuticals represent only 5.5 per cent of the figures we were able to add. We must also consider as a potential those products we were not able to add, such as injectable drugs and antibiotics. Granted, aerosols will probably never reach more than approximately 50 per cent of this potential, due to technical reasons, but even this portion will give the aerosol pharmaceutical industry an ultimate potential dollar value in excess of $300 million.

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ceutical products, but special emphasis must be placed upon educating doctors and pharmacists. If these influential people cannot reassure their patients that aerosol drugs and pharmaceuticals have definite advantages, people will soon lose confidence in the promotional efforts of the marketer. Currently, of more than 65 pharmaceutical colleges in the United States, only four are offering courses with emphasis on aerosol pharmaceutical products. It is doubted that most medical colleges make more than a passing mention of aerosol drugs and pharmaceuticals as therapeutic aids.

The aerosol industry should encourage and help pharmaceutical schools to turn out pharmacists with an understanding of the uses and benefits of aerosol products. With training, many large prescription druggists could learn eventually to fill their own aerosols to cover the small portion of business in which they actually compound the desired prescription. Likewise, efforts should be made to interest medical schools in programs whereby they can learn the advantages of aerosol application of drugs and pharmaceuticals.

Although medical school curriculums are undoubtedly crowded, the aerosol industry should make an effort to have competent, trained aerosol pharmaceutical people lecture to these forth-coming doctors during their classes on medications and pharmacy, to teach them the advantages of aerosols.

Another avenue for reaching the doctor and the pharmacist is the use of industry advertising in the medical and pharmaceutical trade journals.

Although this road to greater sales of aerosol pharmaceutical products will be the rougher road, with increased expenditures for advertising and marketing, there are stepping stones along the way to make things easier. The relatively untouched fields of pressure-dispensed oral drugs and aerosol vaginal products, as well as the recent developments in small and large-dosage metered valves, controlled-area sprays, and the fast-breaking foam, can be used to help the imaginative aerosol pharmaceutical marketer along the way.

Aerosol drugs and pharmaceuticals can either sell themselves at their present rate, or progressive marketing and promotion can help them to become at least a $200 million market or more within the next decade. The choice is up to those in the aerosol and pharmaceutical industries with an interest in increasing profits.

Because I have been dealing with marketing, the dollars-and-cents aspects of the various aerosol drug and pharmaceutical products has been emphasized. The real gains, however, lie not just in increased profits to the aerosol and pharmaceutical industries, but in the potential benefits to medical science from the development of better and easier methods of administering therapeutic medications through the use of the aerosol principle. •

TOXICOLOGICAL ASPECTS OF COSMETICS

(*Continued from page 749*)

Depilatories

The toxicity problems encountered with depilatories are quite similar to those observed with hair-waving preparations. The majority of depilatory products in use at present are also mercaptans, and usually salts of thioglycolic acid. The less soluble salts of thioglycolic acid are more commonly employed. Injuries, when such occur, are also simple dermatoses resembling that of a chemical burn. Excessive or careless use of a depilatory may lead to a denuding of the epidermis that is the result of excessive keratolytic activity.

Incidences of a true cutaneous sensitization from the use of thioglycolates in depilatories or hair-waving preparations are relatively rare.

Hair Dyes

Unfortunately, the cosmetic industry has found no satisfactory substitute to replace para-diaminobenzenes and aminophenols as compounds which satisfactorily impart to the hair relatively dark shades (especially black). Reports of sensitizations[6, 7] to the para-type dyes are fairly numerous, accounting for approximately 24 per cent of the total cases of sensitizations attributed to the use of cosmetics. This high incidence of sensitization occurs in spite of the provision in our Act making mandatory a patch test prior to use.

Occasionally a report is received that the use of para-type hair dyes is suspected of producing blood dyscrasias. Our Skin Toxicity Branch has been unable to produce blood disorders in laboratory animals in 18 weeks of consecutive treatment. It was concluded that no direct relationship could be demonstrated between the topical use of para-type hair dyes and the development of blood disorders.

Coal-tar colors are extremely damaging to eye mucosa. Our Act specifically prohibits their use about the eyes. Nevertheless, an occasional report is received of injury from the accidental introduction of these dye solutions in the eye. We have recently examined samples of such dye preparations following a report of injury in several high-school girls in California, who had used these in their makeup for a high-school play. Their injuries were sufficiently severe to require hospitalization.

Antiperspirants and Deodorants

Deodorants are cosmetic preparations which mask, remove, or decrease perspiration odors, whereas, antiperspirants are substances which, by virtue of their astringent action, inhibit the flow of perspiration. It should be realized that many products in this category should, and indeed are regarded as drugs rather than cosmetics. Whether the Administration regards a product as belonging in the drug or cosmetic field depends upon the label claims made for it. However,

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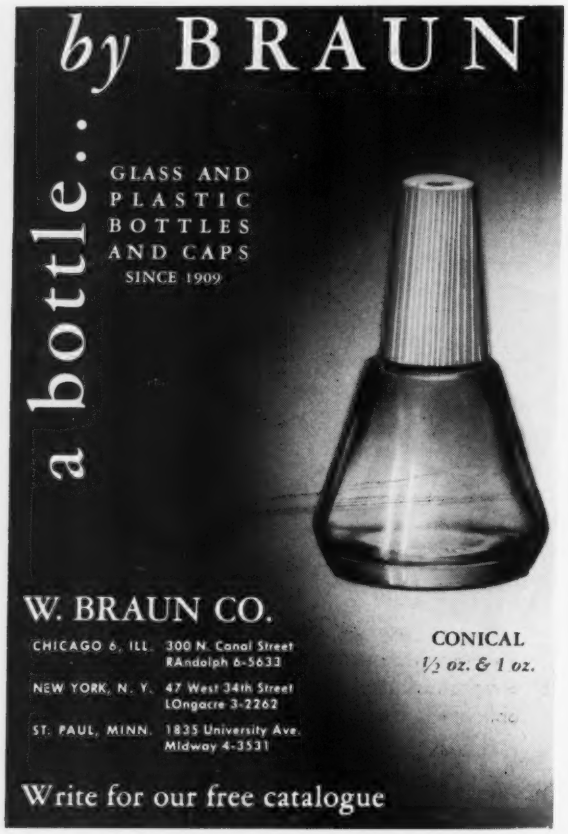
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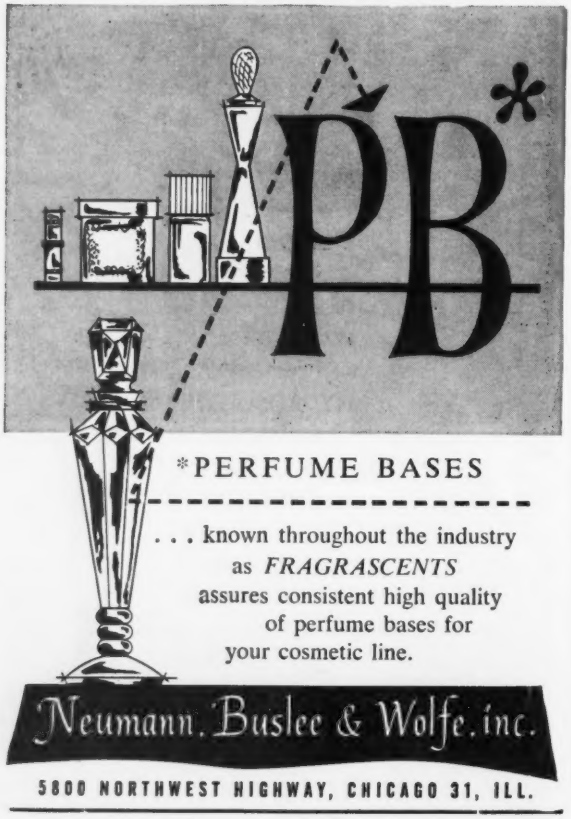
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the Administration would regard a product to be a drug, regardless of its label claims, if the product elicits drug action as defined in the Act.

A substantial number of deodorants owe their activity to their bactericidal or bacteriostatic properties. Antiperspirants, on the other hand, produce their effect by reaction with proteins, thereby blocking or interfering with normal function of the sweat glands. The latter is clearly a drug action. The sulfates and chlorides of aluminum, zinc, and zirconium, and the chlorhydroxide of aluminum are used to produce the astringent, and therefore, the antiperspirant action. These salts are often used in a medium of low *p*H (2.5 to 4.0), that is, in a *p*H range which is conducive to the production of skin irritation, especially in conditions of damaged skin. Reports to us of injuries from the use of antiperspirant and deodorant preparations are fairly numerous, and it must be concluded that these cosmetics are, in general, poorly tolerated by some individuals. The majority of injuries are the result of primary irritation, and occasionally of "skin fatigue," but are rarely the result of cutaneous sensitization.

The introduction of zirconium salts, more specifically the zirconium lactate, in antiperspirant preparations has produced axillary granulomas.[8, 9] This represents a type of toxicity rarely associated with cosmetic use.

Anticholinergic and antiadrenergic drugs have also been proposed for use as antiperspirants; however, such potent agents are strictly drugs and are not, in

Aerosols

A significant number of cosmetic products today are dispensed as aerosols, a form of packaging in which the material is charged in a pressurized container. The material is released under pressure and discharged through a specially designed nozzle, assuming the form of an atomized spray. Propulsion for the material is obtained by means of relatively inert gases held under pressure. Among the more common gas propellants used for this purpose are the fluorinated hydrocarbons under the trade names of Freons, Genetrons, Isotrons, and others; also chlorinated hydrocarbons, for example, ethyl chloride, methylene chloride and others; as well as nonhalogenated hydrocarbons such as propane and butane. As stated above, the propellent gases used in aerosol-dispensed cosmetics are relatively inert and, if injuries do result from the propellant, they are physical burns caused by holding the discharge nozzle at an insufficient distance from the body area treated.

The physical characteristics of the released spray will depend on the nature and composition of the formulation, and also on the mechanical design of the release nozzle. The usual released spray will consist of particles varying from 1 to 50 microns in diameter. The smaller particles (1 to 10 microns in diameter) which remain unimpinged in the inspired air may

readily reach the lung alveoli,[10] greatly complicating the toxicity picture. If the material reaches the lung mucosa, the entire toxicity problem becomes greatly complicated, since it now involves the greater problem of inhalation toxicity.

Miscellaneous Cosmetics

A number of severely toxic metal salts, for example, mercury, lead, arsenic and selenium, are used in cosmetics. Lead is used in hair dyes, selenium and arsenic in shampoo preparations. Mercury has been used since antiquity in various cosmetic preparations and is still used today in bleach-cream preparations. Mercury is not only a very toxic element systemically, but is notorious for producing cutaneous sensitizations. It is our conviction that it would be in the best interest of the cosmetic industry if these toxic metal salts were eliminated from cosmetic formulations.

A number of cosmetic novelties have come to the attention of the Food and Drug Administration, mainly through injury reports. One of these is carbon tetrachloride, a very toxic substance, used for drying hair. Impervious or plastic nail coats, for use in place of the conventional nail polish, have resulted in brown discoloration of nails, even to the production of necrosis and sloughing of the nail itself. Devices for anchoring false eyelashes have produced irritation in the eyelids. Occasionally reports of cheilitis may be traced to use of dyes and other substances in lipstick preparations, which result in a photosensitization. Although all these injuries are serious to the affected party; it must be admitted that their incidence in the general population remains insignificant.

A final problem of considerable toxicological significance involves the concept of producing a cosmetic effect through the oral administration of biologically potent drugs. An example of this is the administration of 8-methoxypsoralen by the oral route to produce sun tanning in the skin when it is subsequently activated by ultraviolet light or by sunlight.[11, 12] Little is known of the potential toxic effects of this drug on normal individuals, nor in individuals in varying degrees of stress (ill health). Much remains to be elucidated on the mechanism of action of the psoralens, their safe dosage levels, possible carcinogenesis, and their potential disturbances in normal skin physiology.

Conclusion

In the average layman's mind, cosmetics denote bland substances, quite devoid of toxicity, which may be used with impunity without the possibility of incurring adverse effects. On the other hand, drugs are regarded as potentially dangerous but essential for therapy. The layman is quite aware that the misuse or abuse of drugs may lead to injurious consequences. Of course, not all cosmetics are devoid of toxicity, nor

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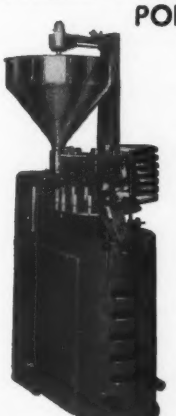

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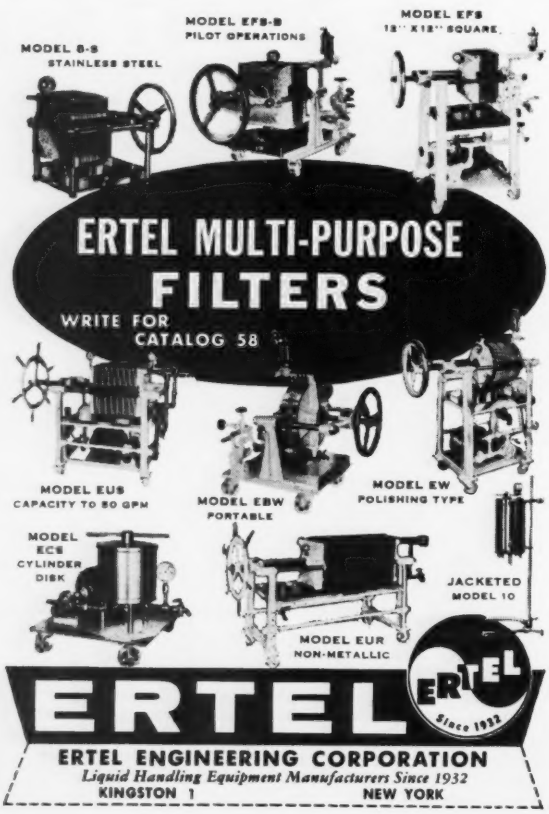

are all drugs severely toxic.

An attempt has been made to review the toxicological aspects of those cosmetics that come most often to the attention of the Food and Drug Administration through receipt of injury reports. A few years hence a report such as this may cover other or yet unknown types of cosmetics. This is a dynamic industry, constantly searching for new substances or new uses for older substances in the development of new cosmetics. The Food and Drug Administration is in full accord with the spirit of dynamic progress in this industry. From the standpoint of toxicity, our primary concern is that new and untried cosmetic formulations be adequately pretested to demonstrate safety for use before their introduction to the general public.

REFERENCES

1. Draize, J. H. and E. A. Kelley. 1952. Toxicity to eye mucosa of certain cosmetic preparations containing surface-active agents. Proc. Sci. Sect. T.G.A. **17:** 1-4.
2. Lehman, A. J. and J. H. Draize. 1959. Dermal and eye mucosal tolerances for certain surface-active agents. Quart. Bull. Assoc. Food and Drug Officials of U. S.
3. Draize, J. H., E. Alvarez, and M. F. Whitesell. 1947. The percutaneous toxicity of thioglycolates. Proc. Sci. Sect. T.G.A. **7:** 29-31.
4. Freeman, M. V., J. H. Draize and P. K. Smith. 1956. Some aspects of the mechanism of the toxicity of thioglycolates. J. Pharm. Exptl. Therap. **118:** 296-303.
5. Freeman, M. V., J. H. Draize and P. K. Smith. 1956. Some aspects of the absorption, distribution and excretion of sodium thioglycolate. *ibid.* **118:** 304-308.
6. Reiss, F., M. Gahwiler and B. Lustig. 1957. Sensitivity to hair dyes. J. Allergy **28:** 134-141.
7. Cosmetic dermatitis: a survey of incidence. 1958. Dermatologica **116:** 419-425.
8. Shelley, W. B. and H. J. Hurley. 1957. Experimental evidence for an allergic basis for granuloma formation in man. Nature **180:** 1060-1061.
9. Rubin, L., A. H. Slepyan, L. F. Weber, and I. Neuhauser. 1956. Granulomas of the axillae caused by deodorants. J.A.M.A. **162:** 953.
10. Draize, J. H., A. A. Nelson, S. H. Newberger, and E. A. Kelley. 1959. Inhalation toxicity studies of six types of aerosol hair sprays. Proc. Sci. Sect. T.G.A. **31:** 28-32.
11. O'Neal, M. A. and A. C. Griffin. 1957. The effects of oxypsoralen upon ultraviolet light carcinogenesis in albino mice. Cancer Research **17:** 911-916.
12. Sulzberger, M. B. and A. B. Lerner. 1958. Suntanning-potentiation with oral medication. J.A.M.A. **167:** 2077-2079.

GLASS CONTAINERS

(*Continued from page 769*)

20 to 30 different containers are designated as gallons, ranging all the way from 128 fl. oz. to 134 fl. oz. and possibly even higher capacity. Our examinations would indicate that some users must be unaware of this situation and fail to specify exactly what capacity they require for their product. As a result of use of oversize gallons, packers find themselves giving away a quantity of product per unit; when this is multiplied by the number of units, the figure can be astounding. The testing required to check on adequacy of containers to fit given product requirements is simple, fast, and very accurate.

Unfortunately, in some instances the problem is confused by the fact that the packer does not have sufficient product quality control to afford the calculations required. We are often shocked to learn that even major glass packers do not know the specific gravity of their product. This physical property, the weight per unit volume, is an excellent quality control tool, yet many manufacturers who

have intricate testing procedures completely ignore this simple check. Whether the specific gravity is checked by use of the weight of a standard volume or with a refractometer, our findings indicate that more of an effort should be made in this direction.

Other than the fact that proper product control affords an opportunity to specify more accurately container capacity requirements, there is the basic economics involved. This amounts to the same thing as the leaking water faucet: the single drop you notice doesn't mean much, but if you multiply one drop per second by the number of seconds per day, week, month, or year, you find that approximately 1,000 gallons of water have gone down the drain. Make certain that you are not pouring money down the same drain.

In conclusion, let me emphasize that the problems I have cited are not theoretical—they are based on actual findings by our routine testing group. You may already have solved such problems within your own operation and, if so, we congratulate you. If you have not, or if it has been some time since you have checked on such matters, we strongly urge you to use the techniques that have become routine procedures in the plants of packaging Goliaths.

If you are in need of assistance or wish to have some testing done by an outside group, check with your glass supplier's technical representative. He has adequately versed personnel who can be of considerable help on these and many other situations that can have considerable economic impact on your operation.

RHEOLOGY IN COSMETICS

(Continued from page 762)

difference between the curves run with a linear and a logarithmic acceleration. Both curves required the same total time for a complete run. Evidently, linear acceleration misses important lower shear rate properties. Moreover, this experiment demonstrates that there is no unequivocal rheology or viscosity for a non-Newtonian liquid, except as it is defined by the conditions of the measurement. A single viscosity value or even a complete rheological curve of an emulsion is meaningless unless it is compared to another value or curve obtained by a set of equally well-fixed conditions.

It is the purpose of this paper to show how different conditions of measurement and product treatment influence the rheological properties of an emulsion. Shaking a lotion usually causes it to become more fluid. The shaking that a woman normally gives to an almost full bottle of lotion does not influence the viscosity. However, when the bottle is less than three-fourths full, normal shaking thins down most emulsions.

Figure 5 demonstrates how much the viscosity of a

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fluid emulsion in a 75 per cent full, one-ounce vial has changed after the container has been turned end over end 100 times.

After being shaken, most commercial cosmetic lotions do not recover their original viscosity, even if kept at room temperature for a long time. In other words, they have a structure which is not regained when once destroyed. Truly thixotropic cosmetic products are rare.

Incidentally, these experiments give assurance that an emulsion poured gently into the container of a coaxial rotary cylinder or bobbin type viscometer is not thinned out in the process of pouring, and that the measured viscosity is the actual viscosity of the emulsion in the bottle.

All emulsions are more or less temperature-sensitive. The cosmetic chemist is interested in the viscosity index of a cosmetic product over the temperature range encountered during storage, transportation, and use. In Figure 6 the results obtained by varying the temperature of a rather heat-sensitive cosmetic product are shown. The crystal structure or "set" at 25° C. gradually disappears as the temperature reaches 32.5° C. If this emulsion is allowed to cool without stirring, it regains its structure when the temperature drops to 25° C. This "setting up" may take several days.

The cone and plate viscometer permits the answering of other frequently asked questions. Namely, is there a noticeable difference in the viscosity of an emulsion throughout the container and, is there a real difference between the fluidity of an emulsion in a small and in a large container? Figures 7 and 8 furnish the answers, at least for the particular product studied and recorded. For the product shown, there is definitely a lowering of the viscosity of the emulsion from top to bottom. This variation is more pronounced in the vial than it is in the larger bottle. In addition, there is a real increase in viscosity of the product kept in the smaller container. In practice, therefore, so-called give-away sample sizes do not represent the flow characteristics of the regular size container because the emulsion in the sampler is actually more viscous than the emulsion in the regular bottle. Also, the lesser amount of bulk in the smaller container provides less force to move the emulsion. Therefore, if the user of the product in the sample size bottle is to be able to judge the viscosity of the product in the regular size bottle, the viscosity of the emulsion in the sampler must be less than that in the regular bottle.

Filling operations are part of bulk manufacture. Figure 9 shows that the product obtained from the opening of a two-ounce collapsible tube is definitely not what the bulk production department had produced.

An important concept of rheology is plastic flow. Most cosmetic products studied have pseudoplastic properties, but some are truly plastic. For example,

the heavy lotion represented in Figures 10 and 11 is of the plastic type. The initial part of the curve goes straight out without any curvature and, when the yield point is reached, the break is abrupt. Furthermore, when the rate of shear is carried up only to 1 r.p.m., both branches of the curve are practically identical, except for the lowest part of the "up" curve. This indicates the structure which gave the yield point has been destroyed by the motion of the viscometer. These graphs can be obtained only if, at very low shear rate values, we have uniform and slow shear rate increases. Normally, one would extrapolate the 0 to 10 r.p.m. curve from the higher values to the X-axis and miss the yield point entirely. Incidentally, when this lotion was tilted very gently it did not flow at all, but it did flow when handled normally.

Figure 10 indicates that this lotion has a second order structure which breaks down above 6 r.p.m. when increased work lowers the viscosity. This is contrary to expectations. The increased work is spent in breaking the crystalline structure.

The discussion of rheology thus far has been primarily concerned with the instrument itself and the factors of measurement and sampling which influence the results. If the conditions of a measurement are perfectly reproducible and we do not get identical results from different batches of the same product, the variations in viscosity curves must be due to the batches themselves. Therefore, the viscometer allows us to select those manufacturing conditions which give the most desirable viscosity. Our work has shown that there are a number of phases in the manufacture of a cosmetic emulsion which must be closely duplicated in order to reproduce a uniform product, batch after batch.

Figure 12 illustrates the necessity of using uniform raw materials. The emulsions under consideration were made from the same formulation and by the same manufacturing process. However, one of the raw materials was supplied by three different producers who sold their product as equivalent materials under an identical name. Obviously the emulsions produced by these "equivalent" materials are not the same. Surface-active materials have very specific effects on the final product. Slight variations in the quality of raw materials used have a noticeable effect on the rheology curves of an emulsion.

Even after the emulsion has been made under identical conditions, aging and time of filling may have a profound influence on the product in the jar or bottle. Figure 13 illustrates the behavior of an emulsion which sets up rather slowly, and requires three days to develop some structure. If the product was filled into the final container before three days, it would have a higher viscosity than when filled after three days, or after the filling operation had permanently broken the partially established structure.

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The question arises, whether it is preferable to age an emulsion under controlled conditions. Each emulsion acts differently and no final answer can be given. Figures 14, 15, and 16 (page 762) show what happens when a product is aged at room temperature, at 40° F., and in a cycling box in which the temperature varies between 38° and 106° F. three times per 24 hours. The viscosity curves, which were run two hours after manufacture of the product, indicate a pronounced yield point. This is probably due to the formation of an amorphous precipitate, which becomes crystalline during aging with free liquid between the particles. Placing the samples in the refrigerator preserves this amorphous structure.

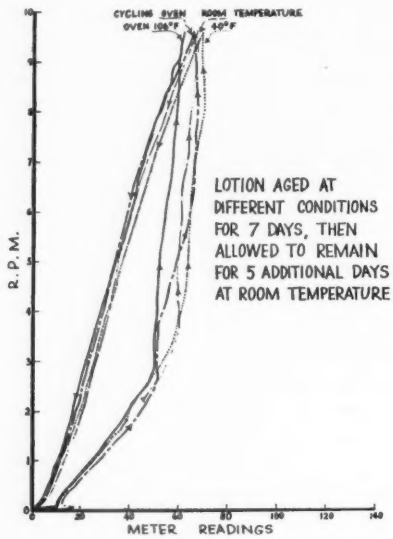
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FIGURE 17

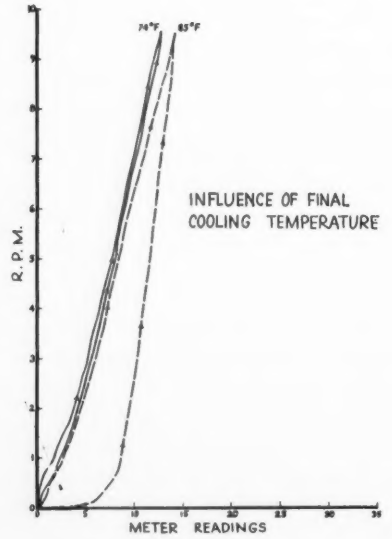

FIGURE 18

It is most interesting, as shown in Figure 17, to compare the curves of the differently aged emulsions after they have been kept for five additional days at room temperature. For this particular emulsion different aging procedures did not have lasting effects.

Figure 18 illustrates the difference between an emulsion that was cooled to 85° F. in the manufacturing process and then reached 75° F. while stored, as compared to one that was cooled to 75° F. in the manufacturing process. The interesting point is that the curves were made after 11 months of storage. This must mean that the fine structure given to the emulsion at the completion of the manufacturing process persists a long time and is probably much more important than the emulsification temperature, which must only be high enough to give fluidity.

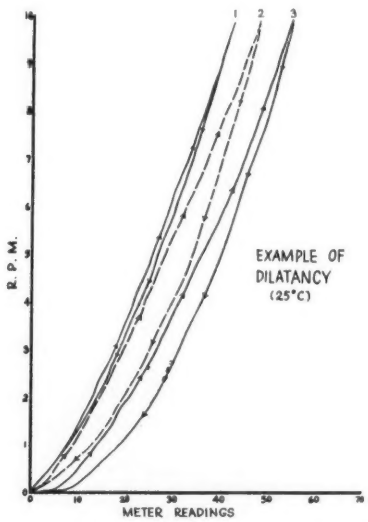

FIGURE 19

Figure 19 illustrates a case of dilatancy in a cosmetic emulsion. Curve 1 is the initial curve. Its "down" branch is just slightly thicker than the "up" curve. The sample was again subjected to increasing work (curve 2) and, true to its dilatant nature, became more viscous. The third time the emulsion was run on the viscometer, its viscosity increased again. This product definitely should not carry the label "Shake Well."

This report is an indication of what can be learned about an emulsion. Some results only confirm what good emulsion chemists have surmised for many years. Others supply answers to puzzling changes in emulsion properties. In still other instances, they give us reasons why the old-time emulsion chemists adhered religiously to successful emulsification methods. Their procedures were just attempts to keep all known and unknown variable under control. However, with precise rheology an established fact, it is hoped that cosmetic chemists have a tool which will enable them to create new types of emulsions with novel cosmetic effects. •

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